



# UNIVERSITY OF UTAH SCHOOL OF DENTISTRY

Re: Opinion and anticipated testimony concerning the death of Gregory Hayes in the case of Susan Johnson v. Davis County.

From: Glen R. Hanson, Ph.D., D.D.S

Date: January 27, 2020

To whom it may concern,

I, Glen R. Hanson, Ph.D., D.D.S., have been asked to opine and describe the content of my anticipated testimony concerning the contribution of drugs being used by Mr. Gregory Hayes, some of which were found in body fluid samples at the time of death when discovered deceased 12/14/2017 at approximately 05:00- 06:00.

I am a tenured professor of Pharmacology and Toxicology and Vice Dean at the University of Utah, School of Dentistry. I hold a D.D.S. degree from the University of California Los Angeles and a Ph.D. in pharmacology/toxicology from the University of Utah. In addition, I was a postdoctoral fellow in neurochemistry from the National Institutes of Health (NIH), Bethesda, Maryland. I have held numerous positions and honors relative to my academic career including; (i) the Director of the Division of Neuroscience and Behavioral Research for the National Institute on Drug Abuse (NIDA, NIH); (ii) Acting Director of NIDA; (iii) Associate Senior Director of NIDA; (iv) Senior Advisor of NIDA; (v) Director and Founder of the Utah Addiction Center at the University of Utah; (vi) Interim Dean and Associate/Vice Dean of the School of Dentistry.

I have received numerous awards and honors from several highly esteemed organizations such as a member of several grant review committees for NIH, associate editor and reviewer for more than 25 of the leading scientific journals in the field of pharmacology, drug abuse and neurobiology and a Senior Scientist award from NIH.

Finally, I have lectured, researched, and published on topics related to the pharmacological effects of sedative drugs such as ethanol, opioids, benzodiazepines, antipsychotics and antidepressants, anticholinergics, and diphenhydramine. My particular area of research relates to the neurochemistry, neurobiology and toxicology of all types of psychoactive drugs of abuse and psychotherapeutics and their effects on the neurotransmitters systems of the brain and other vital physiological systems of the body and their impact, particularly as it relates to CNS functions and toxicity, on drug consumers.

My published research and analyses (in ~240 peer-reviewed scientific papers, 50 chapters in scientific textbooks, and literally hundreds of presentations in scientific meetings) have been confirmed and validated many times over the years and have been approved and accepted by scientists and professionals in the pharmacological and neuroscience communities throughout the world. I am also the senior author on a highly regarded drug abuse-related textbook, in its



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13<sup>th</sup> edition, entitled *Drugs and Society*. This work is currently used as the principal textbook for drug-abuse related courses in hundreds of colleges in the USA and includes chapters on Opioid, Benzodiazepine, Antipsychotic, and Anticholinergic agents that are used for both therapeutic and recreational purposes.

Potentially relevant to the case of Mr. Hayes, my work and the research and scholarly works of other pharmacological experts in the field, I have concluded that combinations of sedating drugs such as opioid analgesics, benzodiazepines (and other anxiolytics), some antipsychotics with sedating anticholinergic action (moderate amount associated with olanzapine) and diphenhydramine (a sedating antihistamine used in OTC medications to induce sleep such as in Tylenol PM) will likely severely depress CNS functions including respiratory systems. These respiratory depressive actions of such sedative drug combinations appear to be more serious during some stages of sleep and on occasions result in death due to respiratory failure.

For this case, I have reviewed legal documents provided by Mr. Michael Homer of Suttter Axland, PLLC, including:

- 'The Office of the Medical Examiner's Report' on the death of Gregory Hayes, signed by Dr. Lindsey Thomas, Assistant Medical Examiner.
- Opinion of expert witness Dr. Kennon Tubbs, retained by Suttter Axland, PLLC
- Opinion of expert witness Tom Green, retained by Plaintiffs.
- Deposition of Daniel Layton, registered nurse, employed by Davis County Jail at time of Gregory Hayes' death.

Based on the above information and testimonies of witnesses and provided reports, it is my opinion according to a reasonable degree of medical certainty that:

- Conclusions opined by Drs. Lindsey Thomas and Kennon Tubbs that Mr. Hayes died from a mixed-prescription drug sedative toxicity consisting of buprenorphine (a commonly prescribed opioid analgesic used to treat both pain or opioid use disorder), clonazepam (an anxiolytic benzodiazepine known as Klonopin) and olanzapine (a second generation antipsychotic with sedating anticholinergic activity also known as Zyprexa) accurately identify the most likely primary cause for Mr. Hayes death.
- In addition, other factors likely contributing to the fatal respiratory failure include (i) the sedating effects of the diphenhydramine (a sedating antihistamine) in the Tylenol PM; (ii) increased sensitivity to the sedative properties of those prescription drugs that had been discontinued several weeks before the fatal overdose event at the jail; (iii) enhancement of drug CNS depressant effects by the normal physiological sedation that accompanies deep-sleep periods (such as early in the morning); and (iii) a history of breathing difficulties including sleep apnea and airway obstruction.



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In summary, I opine that even though the measured levels of the combination of sedating drugs at the time of death, as determined by the Office of the Medical Examiner, were individually within therapeutic ranges, the combination of these CNS depressants, under the circumstances as described by witnesses and retained experts, would have been sufficient to cause a fatal respiratory failure

This pharmacological/toxicological opinion is within a reasonable medical degree of certainty, as based upon the information and testimonies available at the time of its writing.

If there are questions concerning my opinions, please do not hesitate to contact me.

Best Regards,

A handwritten signature in black ink that reads "Glen R. Hanson". The signature is written in a cursive, flowing style.

Glen R. Hanson, Ph.D., D.D.S.

Professor of Pharmacology  
Vice Dean  
School of Dentistry  
University of Utah

**Glen R. Hanson, Ph.D., D.D.S.**

**CV**

***Updated on February 27, 2019***

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## **Personal Information**

Birth date: October 20, 1945

Birthplace: Idaho Falls, Idaho

Family Status: Married

## **Education:**

### Undergraduate Studies:

-Brigham Young University, Provo, UT/1964-1969

### Graduate Studies:

-University of California at Los Angeles, College of Dentistry, Los Angeles, CA/1969-1973

-University of Utah, Department of Pharmacology, College of Medicine, Salt Lake City, UT/1975-1978

### Postdoctoral Studies:

-National Institute of Health (National Heart, Lung and Blood Institute), PRAT Fellow/1978-1980

### Degrees earned:

-Doctor of Dental Surgery (D.D.S.) from University of California at Los Angeles (1973)

-Ph.D. in Pharmacology from the University of Utah (1978)

## **Professional Experience:**

2015-present	Director and Legislative liaison for the Adult Medicaid Dental Program. Medicaid funding approved by State Legislature in SB 39 bill of 2017. This program provides ongoing funding for providing oral health care to the adult Blind/Disabled Medicaid population (~34,000 patients in the State of Utah)
2016-present	Associate/vice Dean U of U School of Dentistry
2014-2016	Interim Dean, University of Utah School of Dentistry
2012-2014	Senior Associate Dean for Faculty and Research, School of Dentistry, University of Utah
2011-2014	One of the Founders for the New U of U School of Dentistry working with Dr. Lynn Powell
2012-present	Tenured Professor, School of Dentistry, University of Utah
2004-2007	ACNP Liaison Committee
2003-2009	Member of ACNP Task Force on Medication Development
2003-2017	Director of the Utah Addiction Center
2004-2014	Senior Advisor, NIDA, NIH
2003-2004	Associate Director for Neuroscience and Translation, NIDA, NIH
2001-2003	Acting Director of the National Institute on Drug Abuse, NIH (directed~\$1 billion annual budget, ~500 member staff and helped to create and implement trans-NIH programs).

2000-2010	IPA appointment (intergovernmental program act for NIH advisors)
2000-2001	Director of the Division of Neuroscience and Behavioral Research for the National Institute on Drug Abuse, NIH (~\$240 million annual budget, ~50 member staff)
1998-1999	Member NIH Study Section: Integrative, Functional and Cognitive Neuroscience I committee
1995-1998	Member NIH Study Section: Drug Abuse Biomedical Research Review Committee Pharmacology II Research Subcommittee (NIDA/C)
2003-present	Ad hoc member of several NIMH, NIDA and Pharmacology (cardiovascular) Special Review Committees (SRC) for grant reviews. Chairman for two of these SRCs
1992 - 2018	Professor, tenured, Department of Pharmacology and Toxicology, College of Pharmacy, University of Utah.
1987 - 1992	Associate Professor, Department of Pharmacology and Toxicology in College of Pharmacy, University of Utah.
1985 - 1989	Member of NIH Study Section: Biological and Neurosciences Subcommittee of the Mental Health Small Grant Review Committee. (ADAMHA/NIH organization)
1986 - 1987	Research Associate Professor, Department of Pharmacology and Toxicology in College of Pharmacy, University of Utah.
1981 - 1986	Research Assistant Professor, Department of Pharmacology in College of Pharmacy, University of Utah.
1985 - present	Faculty member for Neuroscience Program, University of Utah
1982 - present	Adjunct appointment in School of Medicine
1982 - 1988	Practice dentistry part time, Hill Air Force Hospital Dental Clinic (rank of a Major in Utah Army National Guard)
1980 - 1981	Research Associate, Department of Pharmacology in College of Medicine, University of Utah.
1978 - 1980	Staff Fellow in Pharmacology Research Associate Training Program, NIGMS, Bethesda, MD (Project: Biochemical studies of substance P function in rat CNS).
1978 - 1980	Practiced dentistry, part time, Public Health Service Dental Clinic, Bethesda, MD.
1973 - 1975	Private dental practice.

### **Honors and Special National Appointments:**

University of California Regent Scholar, September 1969 to June 1973.

Recipient of a USPHS National Research Service Award from NIDR, Sept. 1975 to June 1978.

Appointment as staff fellow in Pharmacology Research Associate Training (PRAT) Program sponsored by NIGMS, July 1978 to June 1980 (with Dr. Walter Lovenberg).

Scientific Consultant (grant reviewer) to the North Carolina Alcoholism Research Authority, (1985-1994) and the Veteran's Administration (1990-1998).

Ad Hoc Reviewer for: the *Journal of Pharmacology and Experimental Therapeutics*, (1986-present); *J. Neuroscience* (2000-present); *J. Neurochemistry* (1990-present); *Regulatory Peptides* (1990, 1995); *Peptides* (1991, 1992); *Neuropeptides* (1990, 1991, 2004); *Neuroscience* (1991); *Brain Research* (1992-present); *Eur. J. Pharmacol.* (1991-present); *American Journal of Physiology: Heart and Circulatory Physiology* (1994); *Neurotoxicology and Teratology* (1994); *Journal of Pharmaceutical Care in Pain & Symptom Care* (1992); *Neuropsychopharmacology* (1992, 1997); *Biological Psychiatry* (1995); *J. Neuroscience* (1996-present); *European Journal of Neuroscience* (1998); *Pharmacology Biochemistry and Behavior* (1996); *Amino Acids* (1998); *Journal Neuroscience Res.* (2000); *Proceedings of the National Academy of Science* (2001).

Reviewer for Goodman and Gilman Pharmacology Text, 11<sup>th</sup> edition on Neuropharmacology Chapters. Member, ASPET Committee on Drug Abuse: 1989-1992.

Appointment to Special Review Committee, ADAMHA Small Instrumentation Program, 1989 and 1990.

Appointment as Reserve grant reviewer for ADAMHA, 1989 - 1995

Appointment to Special Review Committee for NIDA Contracts, 1990 & 1992.

Appointment to the Public Advisory Committee to National Institute on Drug Abuse, 1992 - 1995.

Ad Hoc Reviewer for grants from Veterans Administration, 1989 - 1995.

College of Pharmacy Distinguished Teaching Award for 1991.

Appointment to the Editorial Advisory Board for Journal of Pharmacology and Experimental Therapeutics, 1993-1996.

Appointment as Specific Field Editor for the Journal of Pharmacology and Experimental Therapeutics, 1995 - 1998.

Appointment as member of ASPET's Subcommittee on Preprofessional Education, 1996 - 1999.  
Chairman of the Committee 1997-present.

Appointment as member of ASPET's Committee on Education, 1998-2001

Appointment as member of ACNP's Liaison Committee, 2003-2005

Appointment as member of ACNP's Medication Development Committee, 2003-2005

Chair, NIMH Search Committee for Director of the Division of Neuroscience and Basic Behavioral Science

Appointment as member of Governor's Methamphetamine Task Force, 2006-2007.

Appointment as a committer member of the Program Advisory Committee for University of Hawaii SNRP (P.I., Dr. Linda Chang). 2007-2013

Recipient of International Association for Dental Research (IADR) Distinguished Scientist Award for Pharmacology/Therapeutics/Toxicology Research (2016 in Seoul S. Korea- \$3500 monetary award)

Elected to Omicron, Kappa, Upsilon Honor Dental Society as Faculty Member, 2017

Recipient of the Outstanding Mentor Award from the inaugural Class of 2017-awarded at Graduation

Recipient of the Extraordinary Faculty Achievements award for 2017 from University of Utah Vice President for Research and J. Willard Marriot Library on April 4, 2018.

#### NIH Ad Hoc Reviewer

- 1). Drug Abuse Biomedical Research Review Pharmacology II Subcommittee (DABR3) - NIH, June, 1995.
- 2). NIDA Special Emphasis Panel (review applications for center and program project grants), 1998, Feb. and Nov. 1999.
- 3). CSR for Special Review Committee, Dec. 1999.
- 4). Pharmacology Study Section, Cardiovascular Sciences Initial Review Group, CSR, Nov. 1999
- 5). NIMH, Conference Review, Dec. 1999, Chair of the Special Emphasis Panel.
- 6). CSR IFCN-2, April 5, 2000, Chair of the Special Emphasis Panel.
- 7). CSR IFCN-1, Mar. 30, 2000, member Special Emphasis Panel.
- 8). CSR, NMB- February, 2012
- 9). CSR, Special Review- July 2013
- 10). CSR, NMB- February, 2014
- 11). CSR, Special Review- Feb, 2014
- 12). CSR, Special Review- Mar, 2016



Senior Scientist Award (K05; DA00378), 1998-2013 (temporarily suspended during my appointments as DNBR director and acting Institute Director at NIDA, NIH, but renewed in 2003 upon completion of my detail to NIDA).

The Phoenix Award, August, 2006 from Organizers of Drug Endangered Children.

CASA (National Center on Addiction and Substance Abuse at Columbia University) Commission on Colleges and Universities, Substance Abuse. Member 2002-2007.

NIH Director's Award for extraordinary scientific leadership of the Molecular Libraries and Imaging Initiative on the Roadmap Program. June, 2007.

Member of the State of Utah Controlled Substances Advisory Committee, Division of Occupational and Professional Licensing. Appointed by Governor Herbert for 2010-present.

Member of the Utah State Marijuana Advisory Board; 2017-present

Office of Vice President for Research, University of Utah, Commendation for Extraordinary Faculty Achievements in Research. April 3, 2019.

### **Major Consulting:**

- 1) Medeva Pharmaceutical: as an expert for methylphenidate litigation (2003)
- 2). Medeva Pharmaceuticals: as an expert for phentermine on Fen/Phen litigation (1997-2000)
- 3). Smith Kline and Beecham: as an expert on Serotonin Selective Uptake Inhibitors for potential litigation against Paxil or paroxetine (2000)
- 4). Expert witness for criminal cases concerning psychotropic medications and/or abuse (1992-2008)
- 5). Expert witness and consultant for King & Spalding LLP in litigations against Purdue Pharmaceuticals relative to OxyContin (2004-2008)
- 6). Expert witness for U.S. Attorney General's Office in lawsuit against the National Park Service.(2008)
- 7) Expert witness for U.S. Attorney General's Office in Federal Court assessment of penalties for Ecstasy (MDMA) (2010)
- 8) Expert witness for Richard, Brandt, Miller & Nelson in Fowers vs. Metamorphis (2009-2012)
- 9) Expert witness for manufacturers of phentermine on fen/phen cases related to patient deaths (~2003-2006).
- 10) Regular expert witness for Salt Lake Public Defenders Office (2008-present)
- 11) Expert witness for Purdue Pharmaceutical on cases related to OxyContin ~2005-2010
- 12) State vs. Danny Logue, Provo Utah (May 2014 for Scott Williams); testified in Court
- 13) U.S. vs. John McGuire, Tampa Bay Florida (November 17-18, 2014); testified for the U.S. Attorney's Office in Federal Court on toxicity of MDMA.
- 14) Utah State vs. Danny Logue (Feb. 4, 2015), Provo, Utah: testified for defendant in State Court on the short- and Long-term effects of methamphetamine.
- 15) Utah State vs. Wyatt Outzen (Mar. 17, 2015), Provo, UT: testified for the State on metabolism of THC and the effects of its metabolites.

- 16) Expert witness in Aurora vs. Dufrense, for Renaud Cook Drury Mesaros, PA law offices: testifying in case involving a suicide by a patient on methadone in a treatment center (~2013-2015).
- 17) Expert witness on ~3-5 criminal case per year
- 18) State v. Anthony Lee Cheever. Testified on behalf of the defendant regarding marijuana use and effects on July 29, 2016
- 19) State v. Alexander Vasquez. Submitted a letter of conclusion concerning the effects of methamphetamine on August 16, 2016.
- 20) Opined in case of Best v. Drew as to the effects of drugs in the death of Ashleigh Best, September 2016.
- 21) Testified in behalf of Roger Bilek in State v. Bilek, October 25, 2016.
- 22) Prepared to testify in a murder case in behalf of Abby Dizon-Maughan. Case settled April 3, 2017.
- 23) Expert consultant for Utah State v. Jeffery Sheppard concerning the effect of methamphetamine. Submitted a letter of opinion on behalf of Mr. Sheppard Nov. 2017.
- 24) Expert witness in case of Carbon County v. Seth Peterson. Testified in trial Dec. 14, 2017 concerning the effects of methamphetamine.
- 25) Expert witness in case of State v. Nicholas Johnson. Testified on effects of alcohol June 22, 2017
- 26) Expert witness in case of State v. Carl Johnson concerning effects of alcohol during a murder. Case settled. November 7, 2018

### **Society Membership:**

Society of Neuroscience  
 ASPET (American Society of Pharmacology and Experimental Therapeutics);  
 CPDD (College on Problems of Drug Dependence)  
 ACNP (American College of Neuropsychopharmacology)  
 IDARS (International Drug Abuse Research Society)

### **Scientific Journal Publications**

#### **Publications in press**

Hanson, G., McMillen, S., Mower, K., Bruett, C., Duarte, L., Koduri, S., Pinzon, L. Warthen, M., Smith, K., Meeks, H. and Trump, B. "Comprehensive Oral Care Improves Treatment Outcomes in Male and Female High-Severity and Chronic Substance Use Disorder Patients (SUDPs). Journal of the American Dental Association

#### **Publications published (243)**

Curtin, K., Fleckenstein, A.E., Keeshin, B. Yurgelun-Todd, D., Renshaw, P., Smith K, and Hanson, G.R. "Increased risk of diseases of the basal ganglia and cerebellum in patients with a history of attention-deficit/hyperactivity disorder." Neuropsychopharmacology 43 (13) (2018) 2548-2555.

Barak LS, Bai Y, Peterson S, Evron T, Urs NM, Peddibhotla S, Hedrick MP, Hersherberger P, Maloney PR, Chung TD, Rodriguiz RM, Wetsel WC, Thomas JB, **Hanson GR**, Pinkerton AB, Caron MG. "

ML314: A biased neurotensin receptor ligand for methamphetamine abuse.” ACS Chemical Biology 11 (2016) 1880-1890.

Pittenger ST, Swalve N, Chou S, Smith MD, Hoonakker AJ, Pudiak CM, Fleckenstein AE, Hanson GR, Bevins RA. Sex differences in neurotensin and substance P following nicotine self-administration in rats. *Synapse* 70 (2016) 336-346.

Fricks-Gleason AN, German CL, Hoonakker AJ, Friend DM, Ganesh KK, Carver AS, **Hanson GR**, Fleckenstein AE, Keefe KA. An acute, epitope-specific modification in the dopamine transporter associated with methamphetamine-induced neurotoxicity. *Synapse* 11 (2016) 1880-1890.

Baladi MG, Nielsen SM, McIntosh JM, Hanson GR, Fleckenstein AE. Prior nicotine self-administration attenuates subsequent dopaminergic deficits of methamphetamine in rats: role of nicotinic acetylcholine receptors. *Behav Pharmacol.* 2016 Feb 11

Vieira-Brock PL, McFadden LM, Nielsen SM, Ellis JD, Walters ET, Stout KA, McIntosh JM, Wilkins DG, Hanson GR, Fleckenstein AE. Chronic Nicotine Exposure Attenuates Methamphetamine-Induced Dopaminergic Deficits. *J Pharmacol Exp Ther.* 355 (2015) 463-472.

Vieira-Brock PL, McFadden LM, Nielsen SM, Smith MD, Hanson GR, Fleckenstein AE. Nicotine Administration Attenuates Methamphetamine-Induced Novel Object Recognition Deficits. *Int J Neuropsychopharmacol.* 18 (2015) 18

Alburges ME, Frankel PS, Hoonakker AJ, Hanson GR. Responses of limbic and extrapyramidal substance P systems to nicotine treatment. *Psychopharmacology (Berl).* 2009 Jan;2015(4):517-27

German, C.L., Baladi, M., McFadden, L.M., Hanson, G.R., and Fleckenstein, A.E. Regulation of the dopamine and vesicular monoamine transporters: Pharmacological targets and implications for disease. *Pharmacological Review* 67 (2015) 1005-1024.

Alburges, M.E., Hoonakker, A.J., Cordova, N.M., Robson, C.M., McFadden, L.M., Martin, A.L., Hanson, G.R. Effect of low doses of methamphetamine on rat limbic-related neurotensin systems. *Synapse* 69 (2015) 396-404.

McFadden, L.M., Vieira-Brock, P.L., Hanson, G.R., and Fleckenstein, A.E. Prior methamphetamine self-administration attenuates the dopaminergic deficits caused by a subsequent methamphetamine exposure. *Neuropharmacology* 93 (2015) 146-154.

Curtin, K., Fleckenstein, A.E., Robison, Reid, Crookston, M., Smith, K., and Hanson, G.R. Methamphetamine/amphetamine abuse and risk of Parkinson’s disease in Utah: a population-based assessment. *Journal of Drug and Alcohol Dependence* 146 (2015) 30-38.

Baladi, M.G., Nielsen, S.M., Umpierre, A. Hanson, G.R., and Fleckenstein, A.E. Prior methyphenidate self-administration alters the subsequent reinforcing effects of methamphetamine in rats. *Behav. Pharmacol.* 25 (2014) 758-765.

Baladi, M.G., Newman, A.H., Nielsen, S.M., Hanson, G.R., and A.E. Dopamine D3 receptors contribute to methamphetamine-induced alterations in dopaminergic neuronal function: Role of hyperthermia. *Eur J Pharmacol.* 732 (2014) 105-110.

- German, C.L., Alburges, M.E., Hoonakker, A.J., Fleckenstein, A.E., and Hanson, G.R. Mephedrone alters basal ganglia and limbic dynorphin systems. *Synapse* (2015) ahead of print.
- German, C.L., Hoonakker, A.H., Fleckenstein, A.E., Hanson, G.R. Mephedrone alters basal ganglia and limbic neurotensin systems. *J. Neurochem.* 130 (2014) 402-407.
- McFadden, L.M., Vieira-Brock, P.L., Hanson, G.R., and Fleckenstein, A.E. Methamphetamine self-administration attenuates hippocampal serotonergic deficits: role of brain-derived neurotrophic factor. *International Journal of Neuropharmacology* 17 (2014) 1350-1320.
- Alburges, M.E., Hoonakker, A.J., Cordova, N.M., Robson, C.M., McFadden, L.M., Martin, A.L. and Hanson, G.R. Responses of the rat basal ganglia neurotensin systems to low doses of methamphetamine. *Psychopharmacology (Berl.)* 231 (2014) 2933-2940.
- Peddibhotia, S., Hedrick, M., Hershberger, P., Maloney, P., Li, Y., Milewski, M., Gosalia, P., Gray, W., Mehta, A., Sugarman, E., Hood, B., Suyama, E., Mguyen, K., Heynen-Genel, Su. Vasile, S., Salaniwal, Su., Stonich, D., Su, Y., Mangravita-Novo, A., Vicchiarelli, M., Roth, G., Smith, La., Chung, T., Hanson, G.R., Thomas, J., Caron, M., Barak, L., Pinkerton, A.” Discovery of ML314, A Brain Penetrant Nonpetidic Beta-Arrestin Biased Agonist of the Neurotensin NTR1 Receptor. *ACS Medicinal Chemistry Letters, J. Med. Chem.* 4 (2013) 846-851.
- McFadden, L.M., Hanson, G.R., and Fleckenstein, A.E. The effects of methamphetamine self-administration on cortical monoaminergic deficits induced by subsequent high-dose methamphetamine administration. *Synapse* 67 (2013) 875-881.
- German, C.L., Fleckenstein, A.E., and Hanson, G.R. Bath Salts and synthetic cathinones: An emerging designer drug phenomenon. *Life Sci.* (2013).
- Hanson, G.R., Hoonakker, A.J., Robson, C.M., McFadden, L.M., Frankel, P.S., and Alburges, M.E. Response of Neurotensin Basal Ganglia Systems During Extinction of Methamphetamine Self Administration in Rat. *J. Pharmacol. Exp. Ther.* 348 (2013) 173-181.
- German, C.L., Hanson, G.R., Fleckenstein, A.E. Amphetamine and Methamphetamine Reduce Striatal Dopamine Transporter Function Without Concurrent Dopamine Transporter Relocalization. *J Neurochem.* 123 (2012) 288-97.
- Hanson, G.R., Hoonakker, A.J., Alburges, M.E., McFadden, L.M., Robson, C.M., and Frankel, P.S.: Response of limbic neurotensin systems to methamphetamine self-administration. *Neuroscience* 203 (2012) 99-107.
- McFadden, L., Hadlock, G.C., Allen, S.C., Vieira-Brock, P.L., Stout, K.A., Ellis, J.D., Hoonakker, A.J., Anderyak, D.M., Neilson, S.M., Wilkins, D.G., Hanson, G.R., and Fleckenstein, A.E. Methamphetamine self-administration causes persistent striatal dopaminergic alterations and mitigates the deficits caused by a subsequent methamphetamine exposure. *J. Pharmacol. Exp. Ther.* 340 (2012) 295-303.
- Hadlock GC, Webb KM, McFadden LM, Chu PW, Ellis JD, Allen SC, Andrenyak DM, Vieira-Brock PL, German CL, Conrad KM, Hoonakker AJ, Gibb JW, Wilkins DG, **Hanson GR**, Fleckenstein AE. 4-Methylmethcathinone (mephedrone): neuropharmacological effects of a designer stimulant of abuse. *J. Pharmacol. Exp. Ther.* 339 (2011) 530-536.

Ellis, J.D., German, C.L., Birdsall, E., Hanson, J.E., Crosby, M.A., Rowley, S.D., Sawada, N.A., West, J.N., Hanson, G.R., Fleckenstein, A.E. Ephedrine decreases vesicular monoamine transporter-2 function. *Synapse* 65(2011) 449-451.

Hadlock, G.C., Nelson, C.C., Baucum, A.J. 2nd, Hanson, G.R., Fleckenstein, A.E. Ex vivo identification of protein-protein interactions involving the dopamine transporter. *J. Neurosci. Methods*. 196 (2011) 303-307.

Frankel, P.S., Hoonakker, A.J., Alburges, M.E., McDougall, J., Fleckenstein, A.E., and Hanson, G.R.: Response of Basal Ganglia Neurotensin System to Methamphetamine Self-Administration. *J. Pharmacol. Exp. Therapeutics*. 336 (2011) 809-815.

Alburges, M.E., Hoonakker, A.J., Horner, K.A., Fleckenstein, A.E., and Hanson, G.R.: Methylphenidate alters basal ganglia neurotensin systems through dopaminergic mechanisms: a comparison with cocaine treatment. *J. Neurochem*. 117 (2011) 470-478.

McFadden, L.M., Hoonakker, A.J., Vieira-Brock, P.L., Stout, K.A., Sawada, N.M., Ellis, J.D., Allen, S.C., Walters, E.T., Nielsen, S.M., Gibb, J.W., Alburges, M.E., Wilkins, D.G., Hanson, G.R., Fleckenstein, A.E. Methamphetamine treatment during development attenuates the dopaminergic deficits caused by subsequent high-dose methamphetamine administration. *Synapse*. 65 (2011) 771-777.

Hadlock, G., Chu, P., Walters, E., Hanson, G.R., and Fleckenstein, A.E.: Methamphetamine-Induced Dopamine Transporter Complex Formation and Dopaminergic Deficits: The Role of D2 Receptor Activation. *J. Pharmacol. Exp. Ther*. 335 (2010) 207-212.

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### **Books (Principal Authorship)**

1. An Introduction to Common Medicines, 1st Edition, 1983: Author.
2. An Introduction to Common Medicines, 2nd Edition, 1987: Author.
3. An Introduction to Common Medicines, 3rd Edition, 1989: Author.
4. An Introduction to Common Medicines, 4th Edition, 1992: Author.
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6. Drugs and Society, 3rd Edition, 1992: Jones and Bartlett Publisher: Senior Author.
7. Drugs and Society, 4th Edition, 1995: Jones and Bartlett Publisher: Senior Author.
8. Drugs and Society, 5th Edition, 1998: Jones and Bartlett Publisher: Senior Author.
9. Drugs and Society, 6th Edition, 2000: Jones and Bartlett Publisher: Senior Author.
10. Drugs and Society, 7<sup>th</sup> Edition, 2002: Jones and Bartlett Publisher: Senior Author.
11. Drugs and Society, 8<sup>th</sup> Edition, 2004: Jones and Bartlett Publisher: Senior Author.
12. Drugs and Society, 9<sup>th</sup> Edition, 2006: Jones and Bartlett Publisher: Senior Author.
13. Drugs and Society, 10<sup>th</sup> Edition, 2009: Jones and Bartlett Publisher: Senior Author.
14. Drugs and Society, 11<sup>th</sup> Edition, 2012: Jones and Bartlett Publisher: Senior Author.
15. Drugs and Society, 12<sup>th</sup> Edition, 2015: Jones and Bartlett Publisher: Senior Author.
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17. Remington Pharmaceutical Sciences, 19th Edition, 1995: Mack Publishing: Editorial Board.
18. Remington Pharmaceutical Sciences, 20th Edition, 2001: Williams and Wilkins: Editorial Board.

### **Areas of Research Interest and Experience**

1. Neurochemistry:
  - analysis of neuropeptides, monoamines, excitatory amino acids and cholinergic transmitter systems in brain, carotid, body, sympathetic and sensory ganglia and in the heart. Evaluation of central and systemic mechanism for stimulants of abuse, antipsychotics, and other psychoactive agents
2. Receptors:
  - analysis of receptor binding properties of substance P, dopamine, cholinergic and serotonergic ligands using homogenate and autoradiographic techniques
3. Transmitter release:
  - analysis of transmitter release from brain and peripheral ganglia using superfusion, push/pull cannula and microdialysis techniques
  - analysis of transporter activity including transporter proteins for dopamine, serotonin, norepinephrine and glutamate
  - trafficking of plasmalemmal and vesicular transporters
4. Oxidative mechanisms and free radicals
  - formation of free radicals evaluated by analysis of free radical trapping
5. Tissue culture technique for the study of neuronal and glial elements of CNS and PNS neurons from sympathetic and sensory ganglia. Evaluation of ion fluxes, in particular calcium, sodium and potassium channels.
6. Electrophysiology in the study of sympathetic reflex systems.
7. Utah Population Data Base used for linkage studies between drugs of abuse and disease outcomes such as ADHD and Parkinson's disease

### **Symposia Organized:**

**Topic:** Pharmacology and Toxicology of Amphetamine Analogs  
**Participants:** Lewis Seiden, Steve Peroutka, James Gibb, Chris Schmidt, Mark Molliver and Ray Fuller  
**Organization:** 1989 ASPET Meeting  
**Role:** Organized and Chaired Symposium

**Topic:** Psychopharmacological Institute on Leisure and Mental Health  
**Meeting:** 1st Conference on Leisure and Mental Health - sponsored by College of Health, University of Utah  
**Participants:** Dr. Sydney Post, Dr. Laura Shane-McWhorter, Dr. Pablo Stewart, Bruce Chandler, Dr. Glen Hanson  
**Role:** Organized and implemented the Psychopharmacological sessions on July 9, 1992 at University Park Hotel.

Topic: Neurotoxicity of Amphetamines  
Participants: Annette Fleckenstein, Chris Schmidt, Bryan Yamatoto, Lewis Seiden  
Organization: 1997 ASPET, San Diego, CA  
Role: Organized and Chaired Symposium

Topic: The Neurotoxicity of Amphetamines and Related Stimulants  
Meeting: A 2-day colloquium supported by a NIDA-funded R-13 award and an ASPET award and held in Washington D.C. April 16,17, 1999  
Budget: \$50,000  
Participants: James Gibb, Lewis Seiden, Charles Vorhees, James O'Callaghan, Glen Hanson, Bryan Yamamoto, Marc Caron, Syed Ali, Annette Fleckenstein, Glenn Dryhurst, Jean Lud Cadet, Donald Kuhn, George Ricaurte, Charles Schuster, Deborah Mash, and Stephen Kish  
Role: Co-chair and organizer with Dr. Donald Kuhn

Topic: MDMA/Ecstasy Research: Advances, Challenges, Future Directions  
 A 2-day conference supported by NIDA and held on the NIH Campus, July 19-20, 2001.  
Participants: The leading international researchers in MDMA research. The objective was to obtain an update of the latest research on MDMA at both the research and clinical level. Total attendance was 565. The opening address was by Dr. Alan Leshner (NIDA director); the keynote speaker was Dr. Ruth Kierschstein (acting NIH Director).  
Role: Co-organizer and conducted conference

### **Highlights of Invited Presentations (277):**

Ten lectures on drug abuse-related topics in “Introduction to Drugs and Society” class at BYU Hawaii University, Feb.-Mar. 2018

Substance Use Disorder & the Adolescent Brain-Why Do They Go Together? Salt Lake County Conference, Salt Lake City, Utah June 14, 2017.

FLOSS presentation- SAMSHA-HRSA, Center for Integrated Health Solutions. Webinar (~600 attendees), June 13, 2017.

Substance Use Disorder & the Adolescent Brain-Why Do They Go Together? Utah County Conference, Provo, Utah June 5, 2017.

FLOSS Presentation, National Oral Health Coalition HRSA Panel Presentation. Albuquerque, April 25, 2017.

Build Up Your Teen Treatment IQ. ATTC Webinar. Jan. 17, 2017.

The Role of Drugs in Dentistry: their use, misuse, excuse and abuse. CE for the University of Utah School of Dentistry CE program. Oct. 13, 2016, Salt Lake City, UT.

Dental Relevance of Substance Use Dependence (SUD) and Rx Abuse-Role of Opioid Drug Management. University of Baylor, Texas A & M College of Dentistry. Faculty Development Seminar, July 15, 2016.

Prescription abuse in Dentistry. Utah Dental Assoc. Conference. April 9, 2015. ~150 attendees.

The Biomedical Basis of Drug Addiction in Adolescents (4 hours presentation). ATTC, Cheyenne, Wyoming, May 6, 2015.

Changing Landscape of Addiction. Collaborative Perspectives on Addiction, 3<sup>rd</sup> Annual Meeting, American Psychological Association, Baltimore Maryland, March 7, 2015.

The Biomedical Basis of Drug Addiction in Adolescents (4 hours presentation). ATTC, Lander Wyoming, Aug. 5, 2014.

Prescription Drug Abuse. Surgical-Medical Society 69<sup>th</sup> Annual Conference, Ogden, Utah. May 16, 2014.

Drug Abuse: Role in Decision-Making. DCSF, Suicide Prevention. Oct. 29, 2013. Provo, UT

Prescription abuse in Dentistry. Utah Dental Assoc. Conference. April 9, 2015. ~150 attendees.

Psychostimulants: Older Designer Skeletons Shrouded in New Cultural Phenomenon. Emerging Trends in the Abuse of Designer Drugs and Their Catastrophic Health Effects: Update on Chemistry, Toxicology, Addiction Potential and Treatment. NIDS Conference. Washington D.C. July 26, 2013.

Management of Oral Pain: Prescription Abuse. University of Utah, School of Dentistry/Utah Dental Association Conference. April 19, 2013, St. George, Utah.

Role of Endogenous Neurotensin (NT) Systems in Extinction of Operant Behavior Associated With Methamphetamine (METH) of Food Self-Administration. 4<sup>th</sup> Annual IDARS meeting, Mexico City, Mexico, April 15-19, 2013.

Pain Medications: Therapy and Abuse. Utah Dental Association Convention, Salt Lake City, UT. Feb. 28, 2013.

Legalization of Marijuana: Fact and Fiction. Salt Lake County Conference on Family Health. Salt Lake City, UT. Feb. 2, 2013

Prescription Drug Abuse: Case, Consequence and Control. 27<sup>th</sup> Annual Update Conference in Physical Medicine and Rehabilitation. Park City, UT, Jan. 31, 2013.

Keynote Speaker: Neurobiological Basis of Poor Decision-Making by Adolescents. Suicide Prevention Conference. Brigham Young University, Provo Utah. November 30, 2012.

Pharmaceutical for Drug Abuse Therapy: How Does It Work? Utah Fall Conference, St. George, UT, September 27, 2012.

Prescription Abuse: Cause, Consequences and Control. Keynote Talk, University of Utah School on Alcoholism and Other Drug Dependencies. University of Utah, Salt Lake City, UT June 18, 2012.

Neurophysiology of Addiction. Physicians' Track, University of Utah School on Alcoholism and Other Drug Dependencies. University of Utah, Salt Lake City, UT, June 18, 2012

Differential Roles of NT Systems in Maintenance, Extinction, & Reinstatement of METH Self-Administration. Winter Brain Conference. January 22, 2012, Alta Utah.

Drug Abuse: A Family Matter. 10<sup>th</sup> Anniversary Silverstein Lectures, Northwestern University, Chicago, October 26, 27, 2011. Two lectures

Brain Development, Drugs and Decision Making. 2011 Utah Fall Substance Abuse Conference, St. George, September 22, 2011. Two sessions.

Neurobiology of Addiction. Seminar to judge, court personnel and DCSF in Carbon County, Price, Utah. Sept. 9, 2011.

Prescription Drug Abuse/Addiction: Cause, Consequence and Control. UPhA (Utah Pharmacists Association) 2011 Conference, Salt Lake City, UT. August 13, 2011.

Presentation to the Utah medical Association on Senate bill SB61 to require 4 CEU hours on topics related to drug dependence/addiction every 2 years for prescribers/dispenser of prescription drugs to renew their Control Substance Licenses. Salt Lake City, UT, January 27, 2011

Presentation to Senate Health and Human Services Committee on bill SP61 to require those who prescribed or dispense prescription drugs to take at least 4 hrs CEU every 2 hours in order to renew their Controlled Substance license. January 2011.

The Science of Drug Abuse and Addiction. West Jordan High School, South Jordan Utah, January 20, 2011.

Report on Spice and its Regulation. Brown Bag meeting, Salt Lake City Government. November 19, 2010.

Prescription Abuse Problems. Parents' Night, Saratoga Springs. November 4, 2010.

Reducing Prescription Drug Abuse. Juab Medical Coalition. Nephi, Utah. September 29, 2010.

Report on Spice, Salvia divinorum and Tramadol (Ultram). Utah Legislature Judiciary, Law Enforcement, and Criminal Justice Interim Committee. September 15, 2010

Reducing Prescription Drug Misuse and Abuse. Sevier County Drug Abuse Conference, Richfield, Utah. September 11, 2010.

Report on Spice, Salvia divinorum and Tramadol (Ultram). Utah Legislature HHS Interim Committee. June 23, 2010. Salt Lake City, Utah

Reducing Prescription Drug Misuse and Abuse. Two Bear River Health Department Seminars, Logan, Utah, April 29<sup>th</sup> and April 30<sup>th</sup>, 2010.

New Perspectives in Drug Addiction Diagnosis and Treatment. Behavioral Science & Health Senior Capstone lecture. University of Utah, March 30, 2010.

Drugs, Brains and Development. Keynote speaker. Utah State Office of Education Conference. St. George, UT. March 1, 2010.

The Science of Drug Abuse and Addiction. West Jordan High School, South Jordan Utah, February 11, 2010.

Prescription Abuse/Addiction Neurobiology: Call to Action. Utah State Legislature, Interim Committee. Salt Lake City, UT. Sept. 16, 2009.

Prescription Abuse: Morbidity and Consequences. Sevier County Workshops on Prescription Drug Abuse. Richfield, Utah. September 13, 2009.

Genetics and Prevention: The Trojan Horse or Marshall Plan. Georgia School of Addiction Studies. Savannah, Georgia, August 31-Sept. 1, 2009.

Role of Genetics in Prevention Studies. Georgia School of Addiction Studies. Savannah, Georgia, August 31-Sept. 1, 2009.

Treatment of the Future: Research Finds of the Brain and Genetics. NAADAC Conference. Salt Lake City, UT. August 21, 2009.

Cocaine Session. Chair. IDARS, Seoul S. Korea. August 18, 2009.

The Role of Neurotensin in Extinction of Methamphetamine Self Administration. IDARS, Seoul S. Korea. August 19, 2009.

Pharmaceutical: Basic Course of Addiction and Behavior. Utah Drug Endangered Children Conference. Westminster College. Salt Lake City, UT. August 5, 2009.

The Neurobiology of Addiction and Recovery: Application to Caregivers. Utah Drug Endangered Children Conference. Westminster College. Salt Lake City, UT. August 5, 2009.

Evolution of the Brain: Insights into Genetics, Health and Disease (Moderator and member of panel discussion). Not Just a Matter of Gray and White: Exploring the Importance of Evolution, Genes and Experience on Brain Development. National Children's Study, NIDA/NICHD. Washington D.C., July 9-10, 2009.

The Neurobiology of Recovery: Basis of Success and Failure. Water Conservancy staff Training, Heriman, UT, June 16, 2009.

**Keynote:**Addiction Vulnerabilities: Implications in Prevention. Midsouth Summer School on Alcohol and Other Drugs of Abuse, University of Arkansas, Little Rock. June 8, 2009.

Genetics and Prevention: The Trojan Horse or Marshall Plan. Midsouth Summer School on Alcohol and Other Drugs of Abuse, University of Arkansas, Little Rock. June 8, 2009.

Drug Abuse and Addiction. Water Conservancy Staff Training. Salt Lake City, UT. June 2, 2009.

Prescription Abuse and drug Disposal. Utah Hospital Association. Salt Lake City, May 29, 2009.

The Neurobiology of Drug Addiction: A Disease Model. Salt Lake Chamber. May 11, 2009.

Neurobiology of Recovery: Basis of Success and Failure. Annual Parental Defense Conference, April 23, 2009. Zermatt Resort, Midway, Utah

Prescription Abuse/Dependence. Pharmaceutical Drug Crime Training for Rocky Mountain High Intensity Drug Trafficking Area, Salt Lake City, UT. April 16, 2009.

Adolescents and Abuse of Opioid Narcotics. Prescription Pain Medication Management & Education Steering Committee, Utah Department of Health, Salt Lake City, UT. March 17, 2009.

METH Neurotoxicity and Its Long-term Effects: It's All In Your Head. Youth Services Training. Salt Lake City, March 17, 2009.

Effects of Nicotine on Limbic and Basal Ganglia Neuropeptide Systems. NIDA presentation, Bethesda, MD. Mar. 10, 2009.

Neurotensin, Mediator of Extinction to METH self-administration. NIDA presentation, Bethesda, MD, Mar. 11, 2009.

Prescription Abuse/Dependence. Legal Workshop. Sundance, UT. Nov. 8, 2008.

Neurotensin, mediator of extinction to METH self-administration. Department of Neuroscience, MUSC, Charleston S.C. Oct. 17, 2008.

The Neurobiology of Drug Addiction. College of Pharmacy, Mercer University. Oct. 20, 2008.

METH Neurotoxicity and Its Long-term Effects: It's All in Your Head. Cache County METH Family Workshop. Oct. 25, 2008.

METH Neurotoxicity and Its Long-term Effects: It's All in Your Head. Idaho Health Care Conference. Pocatello, Idaho, Oct. 23, 2008.

The Neurobiology of Recovery: Basis of Success and Failure. Drug Endangered Children, 5<sup>th</sup> National Conference. Salt Lake City, UT. Oct. 6, 2008.

The Moving Target of Addiction: Past, Present and ????. Keynote Talk. Utah Fall Conference on Substance Abuse. Layton, UT, Oct. 3, 2008.

The Link of Drug Abuse/Addiction With Psychiatric Disorder. Utah Fall Conference on Substance Abuse, Layton, UT. Oct. 2, 2008.

Neurobiology of Addiction: the Disease Model and Mental Health, Health Fair (substance abuse workers), Four Corners, Price Utah, Sept. 23, 2008.

METH Neurotoxicity and Its Long-term Effects: It's All in Your Head. Health Fair (Methamphetamine Families) Four Corners, Price Utah, Sept. 23, 2008

Abuse of Prescription Drugs: What health Providers Need to Know. Health Fair (Health Providers) Four Corners, Price Utah, Sept. 23, 2008.

Role of Genetics in Prevention Strategies. National Prevention Network 21<sup>st</sup> Annual Prevention Research Conference. Indianapolis, IN, August 26, 2008.

Addiction Vulnerabilities: Implication in Prevention. Keynote talk for National Network 21<sup>st</sup> Annual Prevention Research Conference. Indianapolis, IN, August 26, 2008.

Drug Addiction, cognition and vulnerabilities. Utah State Mental Hospital, Provo, UT. July 31, 2008.

Long-term Consequences of Substance Dependence, a Particular Problem of METH and Narcotics. Drug Recognition Conference, Utah State Drug Recognition Expert Program, Utah Highway Patrol. Logan, UT June 12, 2008.

NIDA 35<sup>th</sup> Anniversary. The National Institute on Drug Abuse at 35. Washington D.C., May 21, 2008.

METH Neurotoxicity and Its Long-term Effects: It's All In Your Head. Department of Juvenile Justice, Salt Lake City, UT. May 20, 2008.

METH Effects on Brain and Behavior. Meth and Families: All-Day Workshop. Weber Human Services. Ogden, UT May 17, 2008.

Understanding Drug Addiction, Town Meeting, Gunnison, Sanpete County, May 12, 2008.

The Neurobiology of Drug Abuse and Adolescents. Town Meeting, Pleasant Valley, Sanpete County. May 5, 2008.

METH Families presentation at Richfield activity Day, Richfield, Utah, April 19, 2008.

The Neurobiology of Drug Addiction: A Disease Model. Bingham Memorial Hospital CME. Blackfoot Idaho. March 27, 2008

Transporters of DA: Role in Neurotoxicity and Potential Target for Therapeutics. Finnegan Grand Rounds, Department of Psychiatry, University of Utah, Salt Lake City, UT. March 18, 2008.



Neurobiology of Addiction. Drugs Addiction, Therapy and Crime Conference, U of U Law School, March 13, 2008, Salt Lake City, UT.

The Neurobiology of Drug Addiction: A Disease Model. Distinguish Lecturer, Ohio State University, College of Pharmacy, March 6, 2008.

Methamphetamine-Damage Control: What Does it Really Do to the Brain? Brown Bag Presentation, Salt Lake City Mayor's Coalition on Alcohol, Tobacco and Other Drugs. Salt Lake City Building and local TV broadcasting. February 8, 2008.

Methamphetamine-Damage Control: What Does it Really Do to the Brain? Davis County School Administrators. Farmington, UT, Feb. 6, 2008.

The Biology of Addiction and Its Vulnerabilities. The Utah Department of Health's Tobacco Prevention and Control Program. Layton, UT Jan. 15, 2008.

If it is a disease, can we prevent it. Salt Lake County Substance Abuse System-Day Conference. Nov. 28, 2007, Salt Lake City, UT

Drug Abuse Update: Genetics of Treatment and Prevention. State of Utah Parole Board. Nov. 26, 2007.

The Role of Genetics in Prevention Strategies. Utah Fall Substance Abuse Conference, September 26-28, 2007. St. George, UT

Addiction, Prescription, Conviction: Intersection of Neurobiology, Medicine and the Law. University of Pharmacy Continuing Education Program. August 29, 2007 and Sept. 12, 2007, Salt Lake City and American Fork.

Drug Dependence: Long-Term Changes and Effects. In Search of Signatures of chronic Drug Use. NIDA, Sept. 5, 2007, Washington DC.

METH-damage control: What does it really do to the brain? METH and Families: All-Day Workshop for professionals. Provo UT, August 25, 2007.

Significance of differential responses by neurotensin systems to METH and cocaine self-administration: Therapeutic implications. International Drug Abuse Research Society (IDARS) 1 Aug. 14, 2007.

Singapore Arm Forces Medical Services Conference. Singapore Aug. July 30, 31. Two lectures were presented that included:

- i. Understanding the Nature and Expression of Addiction.
- ii. The Role of Biomedical Research in Developing More Effective Therapeutic Strategies for Addiction Disorders.

Thailand Ministry of Health Conference on Substance Abuse Aug. 2 and 3. Six lectures presented were the same as that presented in Taipei (see below).

Taipei Family Week. Taipei Taiwan, Aug. 9 & 10, 2007. Sponsored by City Government of Taipei. Six lectures presented including:

- i. Neurobiological Basis of Addiction
- ii. Developmental Windows: What makes adolescence a gateway to addiction & Comorbidity, the overlap of psychiatric diseases and SDD.
- iii. Role of Poor Decision Management and Etiologies.
- iv. How are SDDs defined and What is Their impact on Individual Users.
- v. The Basis and Value of the Disease Model to Understand and Deal with SDDs.
- vi. Individual-level strategies Including Behavioral and Medical Interventions. Where Do we Go From Here?

Neurobiology of Addiction/Physicians' section. University of Utah School on Alcoholism and other Drug Dependencies, 56<sup>th</sup> Annual Session. University of Utah, Salt Lake City, UT, June 25, 2007.

Neurobiology of Addiction/Dental and Treatment sections, University of Utah School on Alcoholism and other drug dependencies, 56<sup>th</sup> Annual Session, University of Utah, Salt Lake City, UT, June 25, 2007.

Substance Abuse and the Developing Brain: Why Do We Care?, Education/Prevention section, University of Utah School on Alcoholism and other Drug Dependencies, 56<sup>th</sup> Annual Session, University of Utah, Salt Lake City, UT, June 28, 2007.

The Neurobiology of Addiction: It is no Hokey Pokey. Key Note talk to Judges ASTAR Western Regional West/Northwest Boot Camp, Event 1 in the National Resource Judge Program. June 14, 2007, Seattle, WA, University of Washington Law School sponsor.

METH-damage control: What does it really do to the brain? METH and Families: All-Day Workshop for professionals. St. George UT, June 8, 2007.

METH-damage control: What does it really do to the brain? METH and Families: All-Day Workshop for families and METH users. St. George UT, June 9, 2007.

What Are They Thinking? Child Welfare Success-Children, Parents and You Conference. Child Welfare Institute. Salt Lake City, UT May 15, 2007

Adolescents, the Developing Brain, & Drugs of Abuse: A Recipe for Trouble. 28<sup>th</sup> Annual Troubled Youth Conference. Utah State Services, Snowbird, UT, May 10, 2007.

Methamphetamine Abuse and HIV Neuropathogenesis. Society of NeuroImmune Pharmacology. 13<sup>th</sup> Conf. Salt Lake City, April 12, 2007.

Understanding Substance Abuse & Addiction: Is it all in your head. Educational Resource Development a Council, March 26, 2007, University of Utah.

Drug Addiction and its Biology. Capstone seminar, University of Utah. Feb. 20, 2007.

Your Youth and Drugs. Young President Organization. University of Utah, Salt Lake City, UT, Feb. 15, 2007.

Development of Our Children and Drugs. Salt Lake County Council, Salt Lake City, UT Jan. 9, 2007.

Molecular Libraries Roadmap: Small Molecules, Big Science. Discussant and Co-chair. ACNP 31 (2006) Hollywood, Florida.

Two lectures on METH, the Brain and Behavior. National METH Awareness Day, Library Auditorium, SLC Library, Nov. 30, 2006.

METH and Families: All Day Workshop. Salt Lake City, UT. Sponsored by Governor Huntsman and Utah Department of Human Resources, Nov. 4, 2006.

Why Neurobiology is Important for Treatment. NIDA Blending Conference (*Blending Science and Practice: Bridges to the Future*) Seattle, WA, Oct. 16, 2006.

The Neurobiology of Addiction. 4 talks to Maine Educator, Camden Physicians and Mental Health providers and Community members. Camden Maine, Oct. 5 & 6, 2006.

METH effects on Neurobiology and implication for treatment. ISAM meeting, O Porto Portugal, Sept. 27, 2006.

The Biology of Addiction. Western Regional Meeting of the Federation of State Physicians Health Plans. Bryce Canyon, Sept. 22, 2006.

The Why? And What? of Methamphetamine Abuse. National WIC Association 2006 NWA Nutrition and Breastfeeding Conference. Sept. 21, 2006.

Drug Abuse and METH Addiction. Utah State Parole/Pardons Board. Salt Lake City, UT 9/18/06.

METH, Damage Control: What Does It Really Do to the Brain? Third Drug Endangered Children Conference. Westminster College, Salt Lake City, UT August 17, 2006.

Methamphetamine Addiction and Toxicity. Law Enforcement and Criminal Justice Interim committee, Utah State Legislature. July 19, 2006.

The Molecular Library Roadmap Initiative: An Overview. The NIH Roadmap and Neuroscience Blueprint. CPDD 68th, Scottsdale, Arizona, (June 17-22, 2006) pg. 6, 52.

Methamphetamine: The Here, the Now, and the Why? Annual Conference for Utah District Court Judges. May 25, 2006. Midway, UT

METH Addiction and Toxicity: Clinical Implications. Utah Methamphetamine Joint Task Force. May 15, 2006, Utah State Office Building, Salt Lake City, UT.

Addiction Medicine: What's New?" HIV/AIDS Quarterly Roundtable. Salt Lake City, April 20, 2006.

Methamphetamine, a Metabolic Stressor. Symposium Lecture at The 12<sup>th</sup> Meeting of the Society on Neuroimmune Pharmacology, Santa Fe, NM, April 7, 2006.

Methamphetamine addiction and its implications. Methamphetamine Issues in child Welfare Conference. Utah Court Improvement Program. Mar. 31, 2006 Park City, UT.

Neurotoxicity of Methamphetamine/ NeuroAids and Drug Abuse; NeuroAIDS, Drug Abuse, and Inflammation: Building a Collaborative Research Agenda. NIDA Conference, Washington D.C., Mar. 23, 2006.

Basic Brain Neuroanatomy and Neurochemistry: What's Going On Up There?. 8<sup>th</sup> Annual Fundamentals of Addiction Medicine. Seattle, WA, Mar. 2,3, 2006.

Brain Chemistry and Cognitive Function in Drug Abuse. Fundamentals of Addiction Medicine, Seattle, WA, Mar. 2,3, 2006.

Methamphetamine Pharmacology and Implications on Treatment. CTN Brainstorming Session on METH: Tying Up Loose Ends. ACNP meeting. Hawaii, Hilton Dec. 10, 2005.

2 talks for satellite meeting at AAPS in Nashville Nov. 4 and 5 2005. 1<sup>st</sup> talk on NIDA and Roadmap. 2<sup>nd</sup> talk on METH toxicity.

Cognitive Development & Vulnerability to Addicition-Why Kids are such Lousy Decision Makers. Critical Issues Facing Children & Adolescents, Salt Lake City, UT Nov. 1, 2005.

Methamphetamine and Addiction: the Double Whammy. Joining Forces Conference. Salt Lake City, UT Oct. 3, 2005.

NIH Reauthorization: Why Should We Care? University of Utah Department Chairs Meeting. Salt City, UT. Oct. 3, 2005.

Cognitive Approaches to Addiction: Progress and Pitfalls. NIDA Conference. Chair discussion panel on "What drug abuse brings to the cognitive sciences." Wasington D.C., Sept. 12 & 13, 2005.

Cellular Events Leading to Methamphetamine-induced DA Neurotoxicity. ISN, European Society for Neurochemistry. Cellular and Molecular Mechanisms of Drugs of Abuse and Neurotoxicity. Venice, Isola di San Servolo, Italy. August 16-19, 2005.

Neuropeptide Systems: Targets for Drug Addiction Therapy. Review and Evaluation of NIDA targets for Potential NIH Roadmap Library Screening. Satellite of CPDD, Orlando, Florida, June 17, 2005.

The Neurobiology of Drug Addiction: A Disease Model. Grand Rounds (Internal Medicine), University of Utah, Salt Lake City, UT May 26, 2005

Drug Abuse and Mental Illness: How and Why They are Linked. Utah Spring Mental Health Conference 2005, Park City, May 19, 2005.

Missed Opportunity: Substance Abuse and Primary Care Detection and Treatment. CASA Conference, Missed Opportunity. The Barbara Jordan Conference Center, Washington D.C., April 22, 2005.

The Neurobiology of Methamphetamine-induced Neurotoxicity. Seminar speaker for the Department of Pharmacology and Toxicology at Virginia Commonwealth University, Richmond, VA, April 12, 2005.

Drug Abuse and Mental Illness: How and Why They Are Linked. Methamphetamine Response: A Multi-Discipline Approach. Tennessee Alliance, Nashville TN, March 29, 2005

The Neurobiology of Methamphetamine Neurotoxicity. Methamphetamine Research Workgroup. NIDA/UCLA, Los Angeles, March 9, 2005.

The Pathology of Addiction: What's Up With the Brain. 7<sup>th</sup> Annual Fundamentals of Addiction Medicine. Seattle, WA, March 3, 2005.

Drug Addiction: It is All in Your Head. Salt Lake City Mayor's Drug, Alcohol and Tobacco Coalition. Salt Lake City, UT. Feb. 12, 2005.

Your Brain on Nicotine. Turning Up the Volume on Tobacco Control. Utah Department of Health Tobacco prevention and Control Program. Sheraton City Center, SLC UT, Jan. 20. 2005.

NIH Roadmap: The Journey and Road Hazards. HCI Director's Lecture. University of Utah, Nov. 17, 2004.

Neurobiology of Addiction. Summit Foundation, Las Vegas, October 29, 2004.

What do we know about the neurobiology of addiction: Does it matter? 36<sup>th</sup> Summer CASAT Institute, Las Vegas, August 2, 2004.

The Role of Drugs in Adolescent Emotional Trauma. Intermountain Trauma Network, Salt Lake City, UT, July 16, 2004.

The Role of VMAT-2 Dynamics in the Neurotoxicity of the Amphetamines. Frontiers in Addiction Biology: Genomics and Beyond, Vanderbilt University Summer Conference, Nashville, TN May 24-26, 2004.

Basic Neurobiology and Its Correlation with Co-Morbidity. Utah State Spring Mental Health Conference, 2004. Ogden, UT, May 19, 2004

Drug Addiction: Criminal Justice Vs. Science in the impact on Public Policy. Behavioral Science and Health Senior Capstone. University of Utah, April 6, 2004.

Progress and Priorities at NIDA. Keynote Address, Society on NeuroImmune Pharmacology, SNIP, 10<sup>th</sup> annual meeting on Neuroimmune circuits and infectious diseases. Santa Fe, NM, 2004.

Methamphetamine and Its Role in Addiction. Advances in Psychopharmacology 2004 Conference, Department of Veterans Affairs, Salt Lake City, UT

Psychostimulant-induced Alterations of Monoamine Transport: Mechanisms and Implications for Neurotoxicity. Kevin Finnegan Memorial Lecture. Department of Psychiatry, University of Utah, Mar. 4, 2004.

Methamphetamine 101-Chemistry of Meth, Tennessee's 1<sup>st</sup> Annual conference, Methamphetamine Response: A Multidiscipline Approach to Protecting Tennessee Communities. Nashville, TN, Dec. 2, 2003.

The Neurobiology of Addiction and Social Policy. Society for Neuroscience Annual Meeting, 2003, Social Issues Roundtable. New Orleans, LA

The Neurobiology of Addiction, Minorities and Social Policy. Society for Neuroscience Annual Meeting, 2003, Minority Issues in Neuroscience, New Orleans, LA.

Neurobiology of Addiction. Invited Seminar for the Huntsman Cancer Lecture Series. October 15, 2003.

The Neurobiology of Addiction. Invited lecturer for Genetics and Addiction Master Teacher Program. July 14-19, 2003, University of Utah, Salt Lake City, Utah.

Marijuana and Kids. Part of an expert panel for ONDCP Anti-Drug Media Campaign, the Marijuana Initiative. July 9, 2003. Salt Lake City, UT.

The Neurobiology of Addiction: What Does It Mean for Children and Adolescents. Drug Endangered Children Conference, Idaho. July 8-10, 2003, Boise, ID.

The Neurological Consequences of Methamphetamine Use. Drug Endangered Children Conference, Idaho. July 8-10, 2003, Boise ID.

Overview on Frontal/Prefrontal Functioning. Developing Behavioral Treatments for Drug Abusers with Cognitive Impairments. NIDA Conference, Washington D.C. June 4-5, 2003.

Methamphetamine Neurotoxicity and Long-term Consequences. Drug Endangered Children, Salt Lake City, UT, March 27, 2003.

Endangered Children and Drug Addiction: Keynote Talk. Drug Endangered Children, Salt Lake City, UT, March 27, 2003.

CTN National Steering Committee Meeting, NIDA Director's Report. Albuquerque, NM, March 25, 2003.

Introduction, Stress and the Brain. NIH Symposium for Brain Awareness Week, NIH, Bethesda, MD, March 12, 2003.

Beyond Clinical Walls: Expanding Mental Health, Drug and Alcohol Services Research Outside the Specialty Care System. NIMH, NIDA and NIAAA sponsored Conference "Beyond the Clinical Walls", March 10<sup>th</sup>, 2003, Washington D.C.

Drugs and Pain: Substance Abuse, Addiction and Pain Management. Keynote address at CASA Conference, Feeling No Pain: Substance Abuse, Addiction and Pain Management. New York, Feb. 27, 2003.

Understanding & Treating Drug Abuse and Addiction: What Can Pharmacologists Do? 2003 Annual Meeting of the Association for Medical School Pharmacology. Tucson, Feb. 1, 2003.

Drug Abuse: Morality versus Medicine, Proper Perspective. Town Meeting, Winterbrain, Salt Lake City, Jan. 28, 2003

The Neurobiology of Relapse: Neuroscience Advances and Opportunities. Society of Neuroscience, 28<sup>th</sup> annual meeting, 2002, Orlando Florida.

How the science of stress and substance abuse can influence treatment. International Society for Traumatic Stress Studies 18<sup>th</sup> Annual Conference, Baltimore MD, 2002.

Neuropeptides, a role in drug addiction. Satellite, Society of Neuroscience, 28<sup>th</sup> annual meeting. Orlando, FL, Nov. 2, 2002.

Biology of Substance Abuse, Dual Diagnosis Workshop VA, SLC Health Care System. Salt Lake City, UT, Nov. 1, 2002

Amphetamine, methamphetamine, MDMA and steroids, ASAM Review Course in Addiction Medicine. Chicago, IL, October 26, 2002.

NIDA Director's Report, CTN Steering Committee Meeting, Bethesda, MD, October 22, 2002.

New Research at NIDA, CSAM, Newport Beach, CA, October 11, 2002.

Addiction Medicine Review Course: Cocaine and Methamphetamine, CSAM, Newport Beach, CA, October 12, 2002.

Drugs of Abuse and the Immune System: What do we know about their interactions. Society on NeuroImmune Pharmacology, 9<sup>th</sup> Conference. Clearwater Beach, Florida, October 5, 2002.

Blending Research on Drug Abuse and Mental Health Into Clinical Practice with Latinos. Eighth Annual Latino Behavioral Health Institute, Universal City, CA, Sept. 24-26, 2002.

Hispanic Drug Abuse Research, Advancing the Field-Keynote. Second National Conference Hispanic Drug Abuse Research: Advancing the Field. Universal City, CA, Sept. 26-28, 2002.

Club Drug Use. Rocky Mountain Club Drug Conference. Ft. Collins, CO, September 25, 2002.

New Trends in Drug Abuse. Western Hemisphere Drug Policy Leadership Conference. Washington D.C., September 17, 2002.

Understanding Drug Abuse and Addiction: What Can Psychologists Do?. APA Annual Convention. Chicago, August 22, 2002.

The Neurological Consequences of Club Drug Use. Club Drugs: It's More than just Ecstasy. ADAD Research Forum. Colorado Depart. Of Human Services. Denver Colorado, July 18, 2002.

Clarifying the Controversy about Whether Drug Abuse Influences AIDS Progression. Chair Satellite Session. XIV International AIDS Conference, July 7-11, 2002.

Psychostimulant Abuse and HIV Risk. Chair Satellite Session. XIV International AIDS Conference, July 7-11, 2002.

Determinants of HIV Infection Among IDUs. Chaired Oral Abstract Session. XIV International AIDS Conference, July 7-11, 2002.

The Role of NIDA and the NIH Structure. Department of Pharmacology and Toxicology Seminar, University of Utah. Salt Lake City, June 17, 2002.

Strategies Against Addiction: Medication Development. International Conference on Neuroscience and Addictions: New Developments, New Hopes. Mexico City, June 24, 2002.

Discussant, and Co-chair on the Symposium, Neuropeptidergic responses to psychostimulant drugs of abuse: strategies for drug development. CPDD, Quebec City, Canada, 2002.

Testimony before Canadian Senatorial Committee on Legalization of Marijuana, Ottawa, Canada, 2002

Report from the National Institute on Drug Abuse. CPDD, Quebec City, Canada, 2002.

Molecular Underpinnings of methamphetamine-related neurotoxicity. Neurotoxicity of Methamphetamine Symposium, The HIV Neurobehavioral Research Center and the Scripps Research Institute, San Diego, May 29, 2002.

Novel Effect of Psychostimulants on Monoamine Transporters: A New perspective on Drug Trafficking. Boston University Grand Rounds. Boston, MA, May 8, 2002.

The Process of Addiction: How Does Methamphetamine Fit? NIDA Methamphetamine Clinical Trials Group Meeting. Honolulu, HI, May 9, 2002.

Putting Drug Abuse Research to Use in Real-life Settings. Keynote speaker for Blending Clinical Practice & Research, March 14,15, 2002, New York City.

Nicotine Addiction and NIDA. SRNT (Society for Research on Nicotine and Tobacco) 8<sup>th</sup> National Conference. February 22, 2002, Savannah, GA

Drug Abuse and Addiction, the State of the Science. National Association of Alcohol of Drug Abuse Counselors (NAADAC). Washington D.C., February 25, 2002.

NIDA Director's Report. CTN Steering Committee Conference. Charlestown, SC. January 16, 2002.

NIDA update. 5<sup>th</sup> NIDA Constituency Conference. Virginia. December 3, 2001.



Drug-Seeking Behavior and the Transition to Dependence (moderator and introduction). November 2, 2001. The State of the Art in Addiction Medicine—from Molecules to Managed Care, American Society of Addiction Medicine (ASAM), Washington D.C.

Basic Neurobiology of Addiction. September 12, 2001. Clinical Trial Networks Workshop. National Institute on Drug Abuse, Washington D.C.

Ecstasy: A preclinical evaluation of its potential for neurotoxicity. September 6, 2001. Presented at the U.S.-Netherlands Workshop on Bi-national Research Collaboration on Drug Abuse and Drug Addiction. NIDA-sponsored, Rocky Gap, Cumberland MD.

Overview of MDMA-induced persistent neurotoxicity: Preclinical perspectives. July 20, 2001. Presented at “MDMA/Ecstasy Research: Advances, Challenges, Future Directions” Conference. NIDA-sponsored on NIH campus.

Drug Abuse; A Federal Perspective. April 10, 2001, Motivational Workshop, a joint symposium of the Addiction Research and Education Center (AREC) and the Callister Foundation, University of Utah, Salt Lake City, UT

Effects of Psychostimulants on Monoamine Transporters. February 12, 2001, Psychiatry Grand Rounds, University of Utah.

21st Annual Conference of Agencies and Organizations Serving Troubled Youth. May 11, 2000, Snowdird, UT, Presentation: Drug Abuse: The Role of Brain Chemistry.

Drug Abuse and the Brain. Continuing education presentation to Jordan School District Psychologists and Social Workers, Salt Lake City, May 5, 2000.

Methamphetamine-induced Persistent Deficits in Monoamine Systems and Their Consequences. In: "Chemical Research on the Toxicology of Drugs of Abuse," ACS, San Francisco, Mar. 26, 27, 2000.

Methamphetamine Toxicity. In "METH Think Tank" sponsored by NIDA, Division of Treatment and Development. Washington D.C., Jan. 14, 2000.

Critical Issues in Children and Adolescents, Sept. 3, 1999, Salt Lake City, UT: Keynote Speaker-"Drugs of Abuse".

20th Annual Conference of Agencies and Organizations Serving Troubled Youth. May 13, 1999, Snowdird, UT, Presentation: Drug Abuse: So What's Up in the Brain.

Special Colloquium: "The Neurotoxicity of Amphetamines and Related Stimulants" supported by an R13 (National Institute on Drug Abuse). Title is "The dopamine neuronal system: target and mediator and mediator of amphetamine-induced neurotoxicity." ASPET. Washington D.C., April 16, 17, 1999.

Michigan State University, invited speaker: Methamphetamine Story: the short and long of it. Lansing MI, March 9, 1999.

ACNP (American College of Neuropsychopharmacology) 36th Meeting: Methamphetamine-induced free radical formation: Impact on monoaminergic transporters and enzymes. Hawaii, Dec. 6-14, 1997.

Wayne State University, Grand Round Presentation, School of Medicine: Methamphetamine-induced reactive oxygen species (ROS) cause selective and reversible monoaminergic changes." Detroit, November 12, 1997.

ISN Satellite Meeting, Cellular and Molecular Mechanisms of Drugs of Abuse: Cocaine, Ibogaine and Substituted Amphetamine: "Methamphetamine-induced rapid and reversible decrease in dopamine transporter activity: An oxidative consequence." Hamilton, Bermuda, July 1997.

The Art and Science of Pediatric Nursing, Issues in the 90's: "Over the Counter Drugs: What's New, What's Hot, What's Not." Park City, 1997.

Utah Dental Assoc. Convention, Feb. 1997, Salt Lake City: "Pharmacological Principles and Agents Used in Modern Dentistry."

Pediatric Continuing Education, Apr., 1997, Park City: "Over the Counter Drugs: What's New, What's Hot, What's Not."

The 8th Catecholamine Symposium, Asilomar, Oct. 1996: ""Psychostimulants and Neuropeptides."

Summer Neuropeptide Conference, June, 1996, Martha's Vineyard: "Interaction between Neurotensin Systems and the Stimulants of Abuse."

University of Utah, 1996 Health Sciences Academy, topic: Drug Abuse, April 20, 1996.

University of Utah, Neuroscience Snowbird Minisymposium, May 12, 1995: "The Role of Dopamine in Methamphetamine Neurotoxicity".

CPDD 55th Annual Scientific Meeting, June, 1993: "The Role of NMDA Receptors Systems in Neuropeptide Responses to Stimulants of Abuse". In Toronto, Canada.

The 1st International Conference on Leisure and Mental Health, July 9, 1992: "The Basis of Psychoactive Drugs".

Frontiers in Neuroscience lecture series, University of Utah, "Dopamine regulation of extrapyramidal and Limbic Neurotensin Systems", Oct. 24, 1991.

2nd International Conference on Neurotensin, July, 1991: Responses of limbic and extrapyramidal neurotensin systems to stimulants of abuse: involvement of dopaminergic mechanisms. In Palm Beach, Florida.

C.E. Seminar; "Drugs on the Limbic System: from Agony to Ecstasy". University of Utah, College of Pharmacy, June 1, 1991.

Davis Dental Association in Bountiful, Utah. "Use of therapeutic agents in dental practice". September, 1990.

Seminar; "Interactions between dopamine and neuropeptides in limbic and extrapyramidal structures". Department of Zoology, Brigham Young University. December 6, 1990.

Project "Fun" (University of Utah service project to elderly in Salt Lake City Community) - lecture to elderly on "Use of Common Drugs": September, 1990 and May, 1991. Also lectured to National Society of the Sons of Utah Pioneers on Drugs in the Elderly, Sept. 1991.

American Association of Colleges of Pharmacy (AACP) 91st Annual Meeting. Presentation Title: Neuropeptides: Today's Modulators, Tomorrow's Therapeutics? Salt Lake City, Utah, July 8, 1990.

Mountain West Chapter of the Society of Toxicology, VIth Annual Meeting. Presentation Title: Human and Animal Neurotoxicity from Drugs of Abuse and their Metabolites. University of Utah, College of Pharmacy, Sept. 22, 1988.

National Institute on Drug Abuse Technical Review: Pharmacology and Toxicology of Amphetamine and Related Designer Drugs. Presentation Title - Effects of Amphetamine and Related Analogs on Brain Peptidergic Systems. NIH, Bethesda, MD, August 3, 1988.

## **Research Support**

### 1. Grants:

- a. Institutional Award (University of Utah College of Medicine)  
"Dopaminergic regulation of striatal-nigral SP pathways"  
Principal Investigator: Glen R. Hanson  
March 1981 - February 1982  
\$15,000
- b. RO3 MH37762-01  
"Cholinergic link in dopamine/substance P interactions".  
Principal Investigator: Glen R. Hanson  
September 1982-August 1983  
\$15,000
- c. RO3 MH40175-01  
"Effect of dopamine systems on nigral SP release  
Principal Investigator: Glen R. Hanson  
September 1984-August 1985  
\$15,000
- d. RO1 DA-00869-AOA1  
"Drug Abuse and Regulatory Enzymes of Biogenic Amines"  
Coinvestigator: Glen R. Hanson  
July 1, 1984 - June 30, 1987  
\$271,000
- e. RO1 DA-04222-01  
"Neurochemical Alterations by Designer Drugs"  
Co-principal Investigator: Glen R. Hanson  
August 1, 1986 - July 31, 1989  
\$247,000
- f. RO1 DA00869-13  
"Drug Abuse and Regulatory Enzymes of Biogenic Amines"  
Coinvestigator: Glen R. Hanson  
July 1, 1987 - June 30, 1990  
\$382,000
- g. RO1 DA04222-04  
"Neurochemical Alterations by Designer Drugs"  
Co-principal Investigator: Glen R. Hanson  
Sept. 1, 1989 - Aug. 30, 1994  
\$505,414
- h. RO1 DA00869-16  
"Drug Abuse and Regulatory Enzymes of Biogenic Amines"  
Co-principal Investigator: Glen R. Hanson  
July 1, 1990 - June 30, 1993  
\$377,000

- i. RO1 DA00869-19  
 "Drug Abuse and Regulatory Enzymes of Biogenic Amines"  
 Co-principal Investigator/Principal Invest. (1995-1997): Glen R. Hanson  
 Jan. 1, 1994 - May 30, 1997  
 \$351,598
- j. RO1 DA04222-09  
 "Neurochemical Alterations by Designer Drugs"  
 Co-principal Investigator/Principal Invest. (1995-1997): Glen R. Hanson  
 Oct. 1, 1994 - Sept. 30, 1997  
 \$302,821
- k. RO1 DA09407-01  
 "Role of Neurotensin in Methamphetamine Effects"  
 Principal Investigator: Glen Hanson  
 April 1, 1995 - March 31, 1998  
 \$296,558
- l. RO1 DA 09407-01  
 Underrepresented minority supplement/faculty  
 Principal Investigator: Glen R. Hanson  
 Sept. 1, 1995-March 31, 1998  
 \$125,000
- m. RO1 DA 00869-21  
 "Drug Abuse and Regulatory Enzymes of Biogenic Amines"  
 Principal Investigator: Glen R. Hanson  
 July 1, 1997 - June 30, 2000  
 \$406,000
- n. RO1 DA 09407-03  
 Underrepresented minority supplement/undergraduate student  
 Principal Investigator: Glen R. Hanson  
 June 1, 1997 - Aug. 30, 1997  
 \$8,000
- o. RO1 DA 00869-22  
 "Drug Abuse and Regulatory Enzymes of Biogenic Amines"  
 Principal Investigator: Glen R. Hanson  
 June 1, 1997 - May 30, 2000  
 \$599,477
- p. RO1 DA 04222-12  
 "Neurochemical Alterations by Designer Drugs"  
 Principal Investigator: Glen R. Hanson  
 Oct. 1, 1997 - Sept. 30, 2000  
 \$492,000
- q. RO1 DA 09407-04

"Role of Neurotensin in Methamphetamine Effects"

Principal Investigator: Glen Hanson

April 1, 1998 - March 31, 2003

\$1,010,981

- r. K05 DA 00378  
Senior Scientist Award  
Principal Investigator: Glen R. Hanson  
August 1, 1998-July 31, 2003  
\$533,074
- s. R01 DA 00869-23S1  
Underrepresented minority supplement/undergraduate student  
Principal Investigator: Glen R. Hanson  
June 1, 1998 - Aug. 30, 1998  
\$9,900
- t. R13  
The Neurotoxicity of Amphetamines and Related Stimulants  
Principal Investigator: Donald Kuhn (my role was co-organizer)  
\$15,000
- u. RO1 DA 00869-25  
"Drug Abuse and Regulatory Enzymes of Biogenic Amines"  
Principal Investigator: Glen R. Hanson  
June 1, 2000-May 31, 2005  
\$1,224,250
- v. RO1 DA 04222-15  
"Neurochemical Alterations by Designer Drugs"  
Principal Investigator: Annette Fleckenstein/James Gibb  
My role: Co-investigator  
Oct. 1, 2000 - Sept. 30, 2005  
\$936,875
- w. P01 DA13367-01  
"Differential Effects of Methamphetamine and Cocaine"  
Principal Investigator: Glen R. Hanson/James W. Gibb  
September 1, 2001- August 31, 2006  
\$5,200,309
- x. IPA support (NIDA)  
Salary support as Director of the Division of Neuroscience and Behavioral Research  
NIDA  
September 1, 2000-December 1, 2001  
\$258,000
- y. IPA support (NIDA)

Salary support as the acting Director of the National Institute on Drug Abuse, NIH  
 December 1, 2001-April, 2003  
 ~\$260,000

- z. IPA support (NIDA)  
 Salary support as Associate Director for Neuroscience and Translation, NIDA  
 May 1, 2003-2010  
 ~\$90,000
- aa. RO1 DA 09407-08  
 Role of Neurotensin in Methamphetamine Effects  
 Principal Investigator: Glen Hanson  
 September 1, 2003-August 30, 2008  
 \$1,499,000
- bb. Focused Giving, Johnson and Johnson  
 Methylphenidate-induced Attenuation of Dopaminergic Neuronal Degeneration:  
 Implications for Treatment of Parkinson's Disease  
 Project Director: Annette Fleckenstein (Hanson co-director)  
 \$246,000 (Jan. 2004-Dec. 2006).
- cc. R01 DA 04222  
 "Neurochemical Alterations by Designer Drugs"  
 Principal Investigator: Glen Hanson  
 August 1, 2005-July 31, 2010  
 \$1,121,250
- dd. K05 DA 00378  
 Senior Scientist Award  
 Principal Investigator: Glen R. Hanson  
 September 1, 2007-August 31, 2012  
 \$533,074
- ee. P01 DA13367-06-10  
 "Differential Effects of Methamphetamine and Cocaine"  
 Principal Investigators: Glen R. Hanson/James W. Gibb  
 May 1, 2008- April 30, 2013  
 \$5,100,000
- ff. RO1 DA 00869-26-30  
 Coinvestigator  
 "Drug Abuse and Regulatory Enzymes of Biogenic Amines"  
 Principal Investigator: Annette Fleckenstein  
 April 1, 2005-March 31, 2010  
 \$1,400,000
- gg. R01 DA031883  
 "Role of Neurotensin Systems in Methamphetamine Self-Administration"

Principal Investigator: Glen R. Hanson  
 April 1, 2012-March 31, 2017  
 \$1,567,402.

hh. UR1T1024228 (SAMHSA/NIDA)

Director of the Utah Addiction Center, home of the regional 8 ATTC  
 “Region 8 Addiction Technology Transfer Center”  
 Project Director: Dr. Barbara Sullivan  
 September 1, 2012-August 31, 2017  
 \$3,575,000

ii. T12HP28887-01-00 (HRSA-Health Resources and Services Administration)

Facilitating Lifetime of Oral Health Sustainability for Substance Use Disorder Patients  
 (FLOSS)  
 Director: Glen R. Hanson  
 9/1/2015-8/31/2018  
 \$1,500,000.

jj. R01 DA.....Designer Psychostimulants....

Principal Investigator: Annette Fleckenstein  
 Co-I: Glen R. Hanson  
 April 1, 2017-March 31, 2022  
 \$1,500,000

kk. 1H79SP080971 (SAMSHA)

Provide Training and Technical Assistance to Pre-professionals and Professionals in  
 Substance Abuse Prevention Field: Including Education, Behavioral Health, and Primary  
 Healthcare.  
 Region #8 PTTC (Prevention Technology Transfer Center)  
 Senior Advisor: Glen R. Hanson  
 10/1/2/18-9/30/23  
 ~\$3,000,000

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**TOTAL GRANT SUPPORT = ~\$33,000,000**

2. Contracts

a. Co-director

Genentech contract - Toxicological study of human serum albumin  
 Jan. 1985 - Dec. 1985  
 \$28,099

b. Director



Genentech contract - Study of CNS regeneration  
 Jan. 1989 - Dec. 1989  
 \$40,000

- c. Director  
 Marion Pharmaceuticals - Effect of TA 3090 on CNS neuropeptide Y systems  
 May, 1990 - April, 1991  
 \$42,000
- d. Director  
 Cognetix - Conopeptides and Dopamine Disorders  
 Jan. 1997 - present  
 \$30,000

### **Collaborations**

- a. Study of role of neuropeptides in carotid body and superior cervical ganglia. Collaboration with Dr. Salvatore Fidone (Physiology).  
 1983 -1995
- b. Role of V.I.P. and neuropeptide Y in cardiac function. Collaboration with Drs. Fred Anderson and Michael Bristow (Cardiology)  
 1985 - 1999
- c. Mechanisms of stimulant-induced seizures. Collaboration with Dr. Steve White  
 1990-present
- d. Neuropeptide role in hypoxia-induced neuronal damage. Collaboration with Dr. Fran Filloux (Neurology)  
 1991
- e. Differential responses of neuropeptides to dopamine regulation in rat and mouse. Collaboration with Dr. Pat Sonsalla, Rutgers University, 1992
- f. Regulation of Neurotensin synthesis by dopamine pathways. Collaboration with Drs. Dan Dorsa and Kalpana Merchant, University of Washington, 1996.
- g. Role of Neurotensin and Substance P in variability of responses to novelty. Peter Kalivas, Washington State, 1996.
- h. Role of DARPP-32 in neuropeptide response to METH, Alan Feinberg, Paul Greengard, the Rockefeller University, 1996-1999.
- i. Effects of drugs of abuse on neuropeptide systems in humans. Steven Kish, Clark Institute, Toronto, Ontario Canada, 1997-present.

- j. Affect of neurotensin agonists of neuropeptide responses. Ariel Deutch, Vanderbilt University, 1997-1998.
- k. Effect of conontokin G on neurotensin responses to METH. Tyler McCabe, Cognetix. 1997-1999.
- l. Functional connections of VTA neurotensin systems. Scot Zahm. 2001-2002

### **Teaching Experience**

1. 1981 - 1998: Course master for *Common Medicines*/Lib. Ed., Phcl. 370R (taught Fall, Winter & Spring) - Average enrollment: 400 undergraduate students each quarter  
\* This course alone accounts for almost 25% of the student credits for the entire College of Pharmacy.
2. 1998-2000: Course master for *Common Medicines*. Ph Tx 2700 (taught Fall and Winter semesters). This course has an average of 250 students per semester.
3. 1989 - 1998: Telecommunications course on *Common Medicines*. This Course was broadcast throughout Northern Utah.
4. 1989 - 1999: Developed and administer correspondence course of *Common Medicines*/Lib. Ed. 370.
5. 1982 - 2000: Course master for *Community and Preventive Dentistry*/114 (taught Fall): first year dental students.
6. 1981 – 2000, 2003-present: Contributing lecturer  
- *Pharmacology* 601 and 602 (medical students)  
- *Pharmacology* 571, 573 and 599 (pharmacy students)
8. 1985 – 2000, 2003-present: *Methods in Neuroscience/Neuroscience* 602 (contributing lecturer for graduate students)
9. 1981 – 2000, 2003-present: *Neuropharmacology* 727 (contributing lecturer for graduate students)
10. 1989 – 2000, 2003-present: *Advances in Neuropharmacology* 728 (contributing lecturer; graduate students).
11. 1993 - 1999: *Psychopharmacology* (687R) at Brigham Young University (course master; graduate students in clinical psychology).
12. 1994 - 1995: *Advanced Behavioral Neurobiology* (684) at Brigham Young University (course master; graduate students in clinical psychology).
13. 1995 – 2000, 2003-2014: *Pathophysiology* (PhTx 561) - Directed neuro- & psycho-pathology section (pharmacy students).

14. 2014-present: Evidence-Based Learning (Dent 7110); Course Master- Introduction for D1 dental students to evaluating and understanding the scientific literature using biostatistical approaches.
15. 2014-present: Human Disease and Therapeutics (Dent 7204); Course Master and developer- 10 semester credits- Integrative course to D2 dental students on general pathology and pharmacology.
16. 2016: Dental Anesthesia (Dent 7157); Course Master- Introduction course to D1 dental students concerning local anesthetics and their use in dental practice

## **Institutional Service**

### 1. College

1981-1993	Member of Committee for Continuing Education
1982-1983	Member of Curriculum Committee
1987-1999	Member of Admissions Committee for College of Pharmacy
1990-1991	Search Committee for Chair of Pharmacy Practice
1991-1992	Institute Director of Psychopharmacological Intervention Institute; Leisure and Mental Health, International Conference
1992-1993	Member of the Curriculum Committee
1993	Search Committee for Dean of College of Pharmacy
1999	Academic Awards Committee

### 2. Department

1986-1988	Chairman of Seminar Committee
1987	Member of Selection Committee for faculty position in Department
1988	Chairman of Selection Committee for faculty positions in Department
1989-1996	Member of Graduate Student Recruitment Committee
1990-1995	Director of Department Undergraduate Summer Research Program
1992	Chairman of the Department Retention, Promotion and Tenure Committee
1993-1996	Graduate Training Committee
1994	Member of Selection Committee for faculty position in Department
1995	Chairman of the Department Retention, Promotion and Tenure Committee
1997	Chairman of Task Force on Faculty Development
1999	Member of Search Committee for Director of CHT
2007	Chairman of the Department Retention, Promotion and Tenure Committee

### 3. University

1990-1995	Member of Undergraduate Council
1991-1992	Coordinator of the Psychopharmacological Intervention Institute. One of 6 major institutes to be offered during the First International Conference on Leisure and Mental Health. July, 1992.
1992-1993	Revision of Graduate Requirements Task Force (Member).
1993-1997	Member of Credits and Admissions Committee
1994-1995	Curriculum Committee Neuroscience program
1994-1997	Biosafety Committee
1994	Task force on "Lecturer Rank" (member)
1995-1996	Steering Committee Neuroscience program
1997-1998	University Research Council
1997-2000	Area Committee for Intellectual Explorations Course Selection/Physical & Life Science Area (establish policy and conduct evaluations for the science component of the University's General Education undergraduate requirement)
1999-	Initiator and member of the organizing committee for the Addiction Research and Education Center (AREC). AREC was officially given Center status September 1, 2000. Dr. James Gibb

became interim director until I return from my appointment at NIDA (from Sept. 1, 2000-Sept., 2003)

## **Mentoring**

### 1. Advisor for Postdoctoral Fellows

- a. Dr. Michel Johnson/1984-1987
- b. Dr. Anita Letter/1985-1987
- c. Dr. Annette Fleckenstein/1995-1996 (NRSA Fellow/NIDA supported)
- d. Dr. Wenhau Huang/1995-1997
- e. Dr. Jerry Kokoshka/1998-1999

### 2. Advisor for Graduate Students

#### -Doctoral Dissertation Advisor:

- a. Patricia Sonsalla/received Ph.D. degree - Spring, 1985.
- b. Mario Alburges/received Ph.D. degree - Spring, 1988.
- c. Kalpana Merchant/received Ph.D. degree - Spring, 1989.
- d. Nanda Singh/received Ph.D. degree - Winter, 1992.
- e. Lee Midgley/received Ph.D. degree - Winter, 1993.
- f. John Wagstaff/received Ph.D. degree - Summer 1995; (Awarded PRAT postdoctoral fellowship at NIH, 1995-1998).
- g. Melanie Gygi/Summer 1996; (Awarded NIDA National Res. Service Award for graduate students, 1995-1996).
- h. Jerry Kokoshka Ph.D. 1998
- i. Ryan Metzger Ph.D. Winter 2000; (Awarded NIDA National Res. Service Award for graduate students, 1998-2000).
- j. Heather Haughey Ph.D. Winter of 2000
- k. Scot Westwood Ph.D., Autumn 2000
- l. David Adams (co-mentor with Kristen Keefe) Ph.D., Autumn 2001

#### - Research Rotation:

- a. Joe Ritter/1982-1984
- b. Lisa Matsuda/1984
- c. Kathy Ernst/1984
- d. Werawan Ruangyuttikarn/1985,1986
- e. Kalpana Merchant/1986-1987
- f. Patricia Smiley/1986-1987
- g. Nanda Singh/1988-1989
- h. Lee Midgley/1988-1989
- i. Steve Gygi/1990-1992
- j. John Wagstaff/1991-1993
- k. Melanie Gygi/1993-1994
- l. Jonathan Danaceau/Neuroscience graduate program/1994
- m. Ryan Metzger/Neuroscience graduate program/1995
- n. Brian Jackson/Medical Student/1995 - PhTx 792

- o. Tracie Mercer/Neuroscience graduate program/1996
- p. Scot Westwood/1996-1997, 1997-1998
- q. Heather Haughey/1996-1997
- r. Robert Rendon/Neuroscience graduate program/1997
- s. Scot Westwood 1996-1997
- t. David Chapman 1998-1999
- u. David Adams 1998-1999
- v. Jeffrey Brown/ 1998-1999.
- w. Veronica Sandoval/1998-1999
- x. Kamisha Davis/1999-2000

### 3. Member of Doctoral Dissertation Committee

- a. Michael Peat/1982
- b. Elaine Snowhill/1983
- c. Christopher Schmidt/1984
- d. Steve White/1984
- e. Fae Engstrom/1985
- f. Donald Gehlert/1985
- g. Ted Dawson/1986
- h. Lisa Matsuda/1987
- i. Tyler McCabe/1987
- j. Donna Stone/1988
- k. Zho Zhong Wang (Physiology)/1990-1993
- l. Ikram Elayan/1994
- m. Jamie Edwards/1994
- n. Sterling Sudweeks/1997
- o. Anandita Ganguly, Winter, 2000
- p. Amy Adams (Neuroscience), Spring, 2000
- q. Matthew Barton, Winter, 2001
- r. Michael Edler, Winter, 2003
- s. Jeffrey Brown, Summer, 2001
- t. Veronical Sandoval, Summer, 2002
- u. Evan Riddle, Spring, 2003
- v. Kamisha Davis, Spring, 2004
- w. A.J. Baucum, Spring, 2005
- x. Matthew Reidy, Spring, 2008
- y. Yetty Irwin, Fall, 2009
- z. James Bemel, Spring, 2008
- aa. Charlotte Magee, 2019

-Worked with Pharm. D. graduate students as Teaching Assistants for Common Medicines: 3/year from 1981 - 1988.

### 4. Undergraduate Advisor

- a. Stewart Russell Richards/adviser for Bachelor of University Studies/1988
- b. Ray Ward/adviser for summer research project, 1990
- c. John Kennedy/adviser for summer research project, 1991

- d. Melanie Gygi/advisor for summer research project, 1991
- e. Elizabeth Stratford for summer research project, 1992
- f. Dale Cowley for summer research project, 1993
- g. Kim Davis for summer research project, 1994
- h. Zachery Tittensor for summer research project, 1994
- i. Meisha Beyeler for summer project, 1995
- j. Samira Jean Louis, minority summer student, 1995
- k. Brian Ramos, underrepresented minority supplement from NIDA, Summer, 1997
- l. Alison Schick, senior thesis project, 1997
- m. Milixa Galarche, underrepresented minority supplement from NIDA, Summer, 1998
- n. Yvetter Ugarte, ASPET Summer Undergraduate Research Student

## **Summary of Activities as NIDA Acting Director**

**Glen R. Hanson, Ph.D., D.D.S.**

**Acting Director, National Institute on Drug Abuse (fiscal budget of ~\$950 million; staff of ~500 clinicians, scientist, program officers and support staff)**

**National Institutes of Health, HHS**

### **Summary of Major Programmatic and Management Accomplishments -- FY 2002**

#### **Scientific/Programmatic Leadership (report submitted by independent evaluation to Dr. Elias Zerhouni, the director of NIH)**

Dr. Hanson demonstrated strong leadership over the past year in shaping NIDA's research agenda and information dissemination goals to capitalize on emerging scientific opportunity and best respond to national need. He continued to strengthen the Institute's broad portfolio of ongoing programs while concurrently directing additional efforts and resources toward such high priority areas as the development of anti-cocaine and anti-methamphetamine medications and the systematic testing of new behavioral drug abuse therapies. Under his leadership, substantial progress was also made in the implementation of initiatives launched last year to help respond to increases in the use of "club drugs"; to better understand and combat nicotine addiction; to identify the mechanisms underlying the "transition" to addiction; to explore the genetic and environmental factors underlying vulnerability to addiction; and to more fully understand the mechanisms that underlie drug abuse and addiction through the application of genetic and neuroimaging technologies. In an effort to bring the full power of science to bear on drug abuse prevention, Dr. Hanson oversaw the launch of a new multi-pronged drug abuse prevention initiative to: establish a National Drug Abuse Prevention Research System consisting of Transdisciplinary Prevention Research Centers and multi-site prevention effectiveness trials; to stimulate research to fill critical knowledge gaps; and to translate new knowledge into new interventions. In response to increases in drug abuse in certain areas following the September 11<sup>th</sup> disasters, Dr. Hanson launched a new initiative investigating chronic stress and its relation to drug abuse and addiction to further broaden NIDA's already extensive research portfolio in this area. Dr. Hanson directed the expansion of the National Drug Abuse Treatment Clinical Trials Network (CTN) in size and scope, adding 3 additional nodes this year bringing the structure to a total of 17 nodes and 110 community treatment programs. The 21 research protocols currently at various stages of development, implementation or data analysis within the CTN and the many insightful protocol concepts that continue to be generated by both CTN researchers and practitioners clearly forecast great promise for significantly improving drug abuse treatment throughout the nation using science as the vehicle.

Dr. Hanson has also worked to strengthen NIDA's Intramural Research Program. Over the past year he has met with IRP scientists to help guide the direction of their research efforts to best complement research supported through the Institute's extramural programs. And to further invigorate the research being conducted he has worked with the IRP Scientific Director to recruit a number of additional stellar scientists to join the IRP staff.

#### **Administrative Management**

Dr. Hanson held regular reviews of all of NIDA's contract and management costs this year. His commitment to maintaining Research Project Grants (RPGs) as the mainstay of NIDA research support is clearly reflected in the fact that RPGs funded this year accounted for approximately 70% of NIDA's extramural budget. By continuing existing and adding new Institute-wide staff work groups in emerging areas of crosscutting interest including "club drugs", cognitive science and translationally



oriented approaches, devices and strategies, Dr. Hanson has provided innovative mechanisms for broadening programmatic goals and for increased interaction among Institute staff in both the extramural and intramural programs.

### **Trans-NIH/InterAgency Activities**

During the past year Dr. Hanson served on NINDS's Parkinson's Disease Neuroprotection Trials Oversight Board and has initiated numerous collaborative interactions with other NIH Institutes, jointly sponsoring workshops, conferences, PAs and RFAs in areas of mutual or overlapping interest. Soon after taking on the role of Acting Director he met with most of the IC Directors to explore areas of potential interaction. Throughout his tenure, he has met on a regular basis with several of the other neuroscience-related Institute Directors, including those from NIMH, NIAAA and NINDS to conceptualize and develop collaborative endeavors in such areas as nicotine research, molecular development, phenotypic brain mapping and comorbidity that will help to fulfill the missions of each of the participant Institutes. Of special note is the NIDA/NIAAA Collaboration Committee that he established to strengthen ongoing efforts of common interest to both Institutes and to identify areas and potential mechanisms where additional efforts can be focused. Under his direction collaborations with numerous agencies within the Department, including the Substance Abuse and Mental Health Services Administration and the Centers for Disease Control and Prevention have also been sustained, and productive partnerships continued with the Veterans' Administration, the Departments of Education, Justice, and State, and the White House Office of National Drug Control Policy.

### **Information Dissemination/Constituency Activities**

Dr. Hanson's designation of health information education and dissemination as a key Institute priority continues to ensure that knowledge generated through NIDA-supported research is readily accessible to the drug abuse and addiction field and to the general public. Under his direction, NIDA published the first issue of *Science and Practice Perspectives*, a bi-annual journal that promotes a practical, creative dialogue between drug abuse researchers and treatment providers. He also oversaw preparations for and personally participated in a NIDA-sponsored conference held in New York entitled *Blending Clinical Practice and Research* the goal of which was to share the latest findings generated through drug abuse prevention and treatment research with the practitioner and lay communities. In March 2002, NIDA, under Dr. Hanson's leadership, released *Principles of HIV Prevention in Drug-Using Populations: A Research-Based Guide*, a document reflecting more than a decade and a half of NIDA-sponsored research on the co-occurring epidemics of drug abuse and HIV/AIDS. A series of Public Service Announcements (PSA) were also developed by NIDA this year highlighting the connections between drug abuse and HIV/AIDS. Dr. Hanson oversaw the development of a new addition to NIDA's Research Report Series on *Marijuana Abuse*. In addition, in an effort to raise awareness about the signs, symptoms and neurophysiological and behavioral effects of various drugs, he led NIDA in the creation of an *Asian Americans/ Native Hawaiian and Other Pacific Islanders 2003 Calendar* that will be disseminated this fall. Under Dr. Hanson's direction, NIDA also worked with *Scholastic Magazine* to produce and disseminate a magazine for youth entitled *Heads Up: Real News About Drugs and Your Body*. Dr. Hanson led NIDA's efforts to produce several PSAs--in both English and Spanish--on the topic of anabolic steroid use entitled *Game Plan*, that aired on TV stations across the country in February 2002, and worked with producers of *In the Mix—Reality Television for Teens*—a Public Broadcasting System (PBS) informational series on a broadcast related to Steroids entitled *Steroids: The Hard Truth*. And for the sixth consecutive year, NIDA again joined with the Entertainment Industries Council and the Robert Wood Johnson Foundation in sponsoring a Hollywood event in May 2002 at which juried PRISM awards in a wide range of categories were bestowed on television and film actors, writers, producers and others working in the entertainment industry for their stellar efforts in accurately depicting drug abuse and addiction related issues in the products of their work. Highlights of

this event were taped and broadcast across the country in August 2002 by Tribune Broadcasting affiliated TV stations.

Dr. Hanson has played an active role in articulating for a wide variety of audiences both the science of drug abuse and addiction and many of the key issues currently impacting the drug abuse and addiction field. During the past year he has presented keynote addresses and invited lectures at several dozen professional scientific meetings, medical schools, and practitioner group conferences. In an effort to broadly increase awareness about the advances taking place in the science of addiction, he has also spoken before many lay audiences, and has been interviewed by numerous national TV networks, magazines and newspapers on a wide variety of drug abuse and addiction-related topics. He has also led numerous efforts to assess existing knowledge and further advance our understanding about various aspects of drug abuse and addiction through scientific workshops held this year in such areas as *Adolescent Decision Making: Proximal Processes in Adolescent Drug Abuse*; *Nonconscious Processes in Self Regulation: Application to Drug Abuse and Addiction*; and *Strategies to Improve the Replicability, Sustainability and Durability of HIV Prevention Interventions for Drug Users*. In an attempt to maintain strong ties with virtually all major constituency groups representing drug abuse and addiction related concerns, Dr. Hanson convened NIDA's 7<sup>th</sup> constituent conference which took place in December 2001. Representatives of close to 50 professional and constituency groups interested in drug abuse and addiction participated and provided recommendations for enhancing the usefulness and use of NIDA's research. Dr. Hanson has also given briefings and delivered formal testimony before Congress on a wide variety of issues related to the science of drug abuse and addiction including the commonalities of co-morbid mental and addictive disorders; the effects of MDMA ("ecstasy") and other "club drugs" on the body and behavior; psychoactive prescription drugs and their potential for abuse; and prescription drug abuse and the elderly.

## **Summary of Activity Regarding the University of Utah School of Dentistry and Legislative Actions**

### **Conception**

Working with Dr. Lynn Powell, we directed the development, documentation and approval process to begin a new Dental School at the University of Utah. This was the first new College/School at the University of Utah in 60 years. It was also the first new dental school associated with a major biomedical research university with colleges of medicine, nursing and pharmacy in over 20 years. The plan was approved unanimously by the Academic Senate, Graduate Council, Board of Trustees, Board of Regents and the State of Utah Legislature. The School was officially started in 2013 with an initial class of 20 top students. The building for the new SOD was completed in January 2015 just in time for our 2017 class to start clinical training.

### **Interim Dean**

I was appointed interim Dean of the SOD in October of 2014 after a leadership change was enacted by the Senior Vice President for Health Sciences due to major problems between the initial Dean and SOD personnel including students, faculty and staff. As the interim Dean I directed the move of the School into its new building Ray and Tye Noorda Oral Health Science Building in Research Park.

Notable accomplishments for the School during my tenure as interim Dean from 2014 to May of 2016 were:

- (i) Oversee the initiation of clinical services by the SOD student body
- (ii) Increase in student body from 20 to 46/year
- (iii) Development and finalizing of a 4-year dental curriculum
- (iv) Initiation of major divisions of dental services
- (v) Planning for clinic expansion into community clinics throughout the state
- (vi) Overseeing the very successful DDS licensing accreditation site visits by CODA (Committee on Dental Accreditation—affiliated with the American Dental Association) in Spring of 2013 and 2014
- (vii) Oversee the development and implementation of adult dental expansion into Medicaid and the passage of a state bill to make the SOD of dentistry the principal clinical service provider for these the patients in this program from 2015-present.
- (viii) Development of major governance committees within the SOD for Continuing Education, Assessment and Strategic planning, Diversity, Clinical Governance and Implementation, and Student Recruitment.

### **Legislative Actions**

I have been the principal author and driving force for the following legislative actions in the Utah State Legislature

- (i) 2016- SB274: **Medicaid Dental Waiver Amendments.** This bill was passed unanimously in the Utah Legislature and signed by Governor Herbert to extend dental care to Medicaid Adult Blind/Disabled patients. It outlines the principal role for the U of U School of Dentistry in this program. This bill was sponsored by Representative Steve Eliason and Senator Steve Urquart
- (ii) 2017-SB272: **Medicaid Dental Waiver Amendments.** This bill identified \$1.4 million state money in ongoing Medicaid money for the state portion of the cost to implement SB272 which provides comprehensive dental care for blind/disabled adult patients (~ a total of 44,000 patients statewide), preferentially through the U of U School of Dentistry (UUSOD) throughout the Wasatch front. Patients began receiving dental services as of July 2017. The SOD dental network provided dental care to ~2,000 patients in the first year which

represented ~ 50% of those seeking dental care under this program throughout the state of Utah. Under this very unique (first such program in the country) the UUSOD covers the state's portion of the seed for the patients they treat under this program. This bill was sponsored by Representative Steve Eliason and Senator Allen Christensen and passed through the legislative process unanimously.

- (iii). 2017-HB175: **Opioid Abuse Prevention and Treatment Amendments.** This bill requires controlled substance prescribers to receive training in a nationally recognized opioid abuse screening method and requires reimbursement for the screening services. This bill was sponsored by Representative Steve Eliason and Senator Brian Shiozawa.
- (iv). 2018-HB435: **Medicaid Dental Benefits for TAM patients through Medicaid Dental Waiver.** This bill provided comprehensive dental care to TAM (Targeted Adult Medicaid program) patients who qualified for Medicaid benefits due to their substance use disorders problems. This bill provided these patients comprehensive dental care like that described above for adult blind/disabled Medicaid patients (see bill SB272 for 2017 above). This bill identified the UUSOD as the sole-source provider of dental care for this population and included ~4-5,000 patients throughout the state. The basis of this program were observations from my HRSA grant that comprehensive dental care for clients receiving SUD treatment dramatically improved the therapeutic outcomes for these SUD persons. This bill was sponsored by Representative Steve Eliason and Senator Peter Knudsen. The bill passed through the legislative process with only one dissenting vote and was implemented as of February 1, 2019.
- (v). 2019-SB11 **Medicaid Dental Benefits for the Elderly.** This bill is intended to provide comprehensive dental care to elderly ( $\geq 65$  years of age) Medicaid patients. The dental care will be like that described above for adult blind/disabled and TAM Medicaid patients described above and includes ~12,000 patients throughout the state of Utah. This bill identifies the UUSOD as the sole-source provider of dental care throughout the state for this population. This bill is sponsored by Senator Allen Christensen and Representative Stephen Eliason. It has passed through the HHS interim committee and will be voted on by the general assembly during the 2019 legislative session in February/March. If approved, the patients will be seen January 2020.